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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1878.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1878.

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CHAPEL 1878-9

The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements, or the correctness of the opinions expressed in the papers and discussions now or before published; but undertakes only to present these papers and discussions, or the substance of them, correctly. The award of a prize or gratuity for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

William C. Strong, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 5, 1878.

A duly notified stated meeting of the Society was holden at 11 o'clock, and was called to order by Francis Parkman, the retiring President, who reviewed the history of the Society during the three years of his administration, and introduced the President elect, William Gray, Jr., in the following address:

ADDRESS OF PRESIDENT FRANCIS PARKMAN.

Ladies and Gentlemen:

My official relations with you, as President of our Society, end today, though I am happy to feel that my personal relations with you will remain unaltered. During the term of my office, some changes and developments have taken place, of which it may be well to note the principal points. I spoke at our last annual meeting of the organic changes in the laws of the Society, so that it is needless to dwell on them now, farther than to observe that they have resulted in increased efficiency, harmony, and security, and have supplied what was before extremely defective, if not entirely wanting, — a means of redress to those who have grievances to complain of. In this consists one of the chief functions of the Executive Committee, as now constituted. It is its duty to give hearing to every complaint, and see that justice is done; yet every

person who may prefer to appeal directly to the Society itself, remains, as before, perfectly free to do so.

The character of our exhibitions may be taken as the best measure of our progress. In many respects they have distinctly improved. In the ornamental departments, the improvement has been, at some points, a very marked one. Such superb specimens of pot-grown plants as were seen last September in our Hall, were never seen there before. There has been great zeal, on the part of both amateur and professional cultivators, in the introduction of new and rare varieties. Much, too, has been done in the raising of seedlings. But nowhere has there been more improvement than in the show of roses, which has far surpassed that of former years, both in the perfection of single flowers, and in the specimens grown in pots. This last is a feature of our exhibitions, which till recently, could hardly be said to exist. What are known as "general displays" have held a less prominent place than formerly, and the Flower Committees have shown a just sense of the interests of high culture by rewarding quality rather than quantity.

The culture of fruits, and vegetables, being far better developed in this country than that of flowers, does not afford the same scope for improvement. In some particulars, the farthest progress seems to be reached already. In pears, for example, it would be hardly reasonable to expect any conspicuous improvement from year to year. In grapes, again, the case is different; and let us hope that our exhibitors will not rest content till they have equalled, at least under glass, the highest results of European culture.

In regard to all our exhibitions, and, in fact, all our proceedings, the great danger is of getting into ruts and staying there. We offer prizes to stimulate progress, and sometimes the purpose is very well answered. But no observing person can frequent our exhibitions without seeing that, in certain departments, there is a tiresome routine, week after week and year after year. He sees cards marked "First Prize," "Second Prize," "Gratuity," etc., placed against objects neither better nor different from those he had seen distinguished in the same way four or five years before. In these cases, and they are too numerous, the Society misses its mark and throws away the means that ought to be used to promote a true progress. He who presses onward should win the prize, and not he who follows his own tracks in a circle. If the committees will firmly withhold prizes unless there is positive merit in the object

exhibited, they will have more money left for those who deserve it, and will greatly help the Society to fulfil its mission. In cases where there has been no perceptible improvement for a long time, it might be well to suppress the prize altogether for a year or two.

The discussions on horticultural subjects have been of great service, and are, in my opinion, one of the best of the new features lately added to the Society. Much as they have done for us already, they are capable of doing far more. With us, as with all horticultural or agricultural clubs or societies, discussion is subject to the same evil that besets our exhibitions. It is apt to go round with the same persons, in the same groove, keeping all the time at about the same level of intelligence and knowledge, and so fail to gain its real object, which is to develop those habits of investigation and reflection, without which the horticulturist can never be master of his craft. Now I do not say that our discussions have been of this barren sort. On the contrary, I think that they have done real good. But, judging by former years — for during the last I have unfortunately been unable to attend them — they might be made to do a great deal more good. If members would more generally share in them, preparing themselves beforehand to do so by recalling what their own experience may have taught them about the subject announced, and then, by means of books and journals, comparing their own results with those reached by others, our discussions would become a powerful means of stimulating observation and thought.

Two other experiments have been made of late in connection with the discussions, and with similar objects. Prizes have been offered for Essays; and persons of known ability, not always members of the Society, have been invited to deliver lectures before it. Both experiments have had a good degree of success. Some of the lectures especially have been admirably suited to awaken interest and kindle a spirit of inquiry.

There has been great improvement in our printed Transactions, both in the quantity and quality of their contents, and in typographical and literary correctness.

The History of the Society, so long in preparation, is now substantially finished. It embodies a vast amount of information, and will be not only a minute record of our own history, but also an important contribution to that of American horticulture.

The Society has had its part in the financial depression of the

time, though by no means to the same degree as many other moneyed corporations. The restriction of income arising from this source and from the failure of the expected dividend from Mount Auburn, has been accepted by you in a spirit of patience and wisdom which, if continued, will ensure for us in its season a return of ample prosperity.

And now, ladies and gentlemen, I take leave of an office in which all my relations with you have been pleasant from beginning to end. I thank you heartily for the good will and friendliness you have shown towards me throughout, and I congratulate you no less heartily on your choice of my successor. This choice is in itself a promise of continued progress and fresh honor. Mr. President, I welcome you to your new office.

Mr. Gray, on taking the chair, delivered the annual address, as follows: —

Address of President William Gray, Jr.

Ladies and Gentlemen of the Horticultural Society:

On entering upon the duties of the office to which you have called me, I wish first to express my sense of the honor you have conferred. It is a place of responsibility and trust, and has in the past been filled so worthily that one may well feel anxious lest he fall below the high standard which his predecessors have established. That I will do the best that in me lies for the welfare of the Society, is all that I can say; and to enable me to do even this, I ask hearty and cordial assistance from you all.

I will not dwell on the past with which you are familiar. I would rather today look forward and see what in the future demands our attention; and first in regard to the financial condition of the Society.

In common with the whole country, we are suffering from the general depression of business; this affects our income, and the lessening of our means must be met by a corresponding reduction of our expenditures — a law which cannot be evaded with impunity by corporations or individuals. This enforced economy has, however, its compensations; it shows us how little of our real happiness depends on what can be bought with money; it forces us to find in ourselves, or in our previous acquisitions, elements of interest not suspected before; it will bring back in the course of time, perhaps

by many a hard experience, some of the habits of that old New England thrift, so much out of fashion of late. With us there has been a reduction of salaries, not because the services were worth the less, but because we could not pay the old rates. It has been accepted cheerfully by those most concerned, and we shall all rejoice when the time comes for restoring them to their old basis. The Schedule of Prizes has been thoroughly revised, and a considerable saving made in the amount offered for the coming year. We should remember how bountiful our Society has been in this respect when it had the means. The schedule of prizes for 1830 was $188, this has been increased from year to year with our prosperity, until in 1876 the amount was $6,800. For 1878 the amount is $4,575. Let us all look to it that there be no falling off in the exhibitions. It should be no question of dollars and cents; it is a question of the honor of our Society, which I trust will be upheld by its sons and daughters should it become necessary to suspend the prize list altogether.

We owe a debt here which can never be repaid; for a noble library, which few, as individuals, could afford to own; the opportunity week by week of seeing so much that is rare and beautiful in fruits and flowers; the meeting on common ground with those from every walk in life, brought together by a common love of Nature. And to many, perhaps, the lessons learned here have developed tastes which have been the sources of the purest and highest happiness of their lives.

I can feel no misgiving as to the future, if we are but true to ourselves. Let us consider what to-day is necessary to success in any department of human affairs. I should sum it all up by saying that to do one thing and that well — better if possible than any one else — in other words, to have a specialty and stand or fall by our success in that. This New England of ours is growing old; her fields, never rich, are less productive than ever; her sons do not take kindly to a farmer's life; you will see that the tide of population is steadily setting towards the large cities and manufacturing centres. This may not be an unmixed evil, but, unless the old out-of-door life is replaced by some taste or pursuit which shall relax the constant strain imposed by the modern system of society, it seems to me that New England has seen her best days. Such relaxation is within reach of us all, and is probably practised daily by all here.

I would say to you, Do what the manufacturers in this part of the country are doing—making specialties in their business. In the South, close to the cotton fields; in the West, close to the sheep farms, factories are being built to use the raw material where cheapest. Our factories, at a disadvantage because of the distance from their supplies, are making finer fabrics, in which labor is the larger part of the cost, using less cotton and wool, and more brains; and this must continue as the price of their success.

The same rule I hold to be true of horticulture; we must seek quality rather than quantity. With glass and coal and skill we can rival the tropics in the luxuriance of palm and fern, and set winter at defiance; but, do we do this well, that is, economically and to the best result? I should have to answer, No. There are some exceptions, but I think the general level is not a high one. People are too ambitious; they undertake too much; perhaps it would be more accurate to say that their love of plants is too strong for their judgment, and they fill a greenhouse, or plant their trees, and can never afterwards make up their minds to thin out. But whatever the cause, I think the fact cannot be disputed.

The remedy is plain if we will but apply it. The sum of human knowledge is growing unwieldly; there are more books written in a year than can be read in a lifetime; the real work is done, the real success attained, by those who give their lives to single objects. And this, I think, is what we should do, whether horticulture be the business of our life, or the relaxation from other pursuits—choose one department of it and excel in that; and not be content with anything short of the highest results that skill and energy and a single-hearted devotedness to the object of our choice, whatever that may be, can accomplish.

In closing, I must refer for a moment to the friend whom I succeed here, as a striking example of this principle. His life-work has been a specialty pursued under difficulties that none can fully appreciate. His relaxation has been in various specialties at various times. His histories will be the enduring monument of his success in the former, and in the latter, we all know how easily he has been first among us in whatever he has undertaken.

Marshall P. Wilder announced the death of Professor Jared P. Kirtland, LL. D., of East Rockport, Ohio, an Honorary Member of this Society, at the advanced age of eighty-four years; and said that Dr. Kirtland was one of the remarkable men of our age, and

for his scientific investigations and practical labors in a wide field in natural history, for more than fifty years, he has left a fame rarely achieved. As a horticulturist and botanist, he has been constantly at work for this long period, and his success in the production of new varieties of fruits and flowers is widely known, and the results of his labors are to be found in the gardens and orchards of our country. He gave special attention to crossing the grape, raspberry, and other fruits, particularly the cherry. The same might be said of his efforts in the hybridization of the tree pæony, one of the seedlings of which he dedicated to the speaker. He was exceedingly successful in grafting and budding the magnolia, and has left, surrounding his residence, very large trees of many rare foreign kinds which are difficult to propagate. He created the Cleveland Society of Natural History, and was for a long course of years its President. He was chosen a member of the American Philosophical Society, the highest recognition of scientific labor known to the New World. He was for many years professor in several medical schools, and was President of the Kirtland Society of Natural History, besides filling many other places of honor and trust. His interest in Natural History commenced in his youth, and he was intimately acquainted with the habits of beasts, birds and fishes, and particularly interested in the artificial production of fish. His writings on the various branches of natural history have been frequently published and widely read. He was winning in his manners and benevolent in his disposition. His great age was the result of an active, well-ordered life, devoted to the public good, and he retained his interest in his studies to its close. His name will be cherished as that of one of the most useful men of his time, and his example is worthy of our imitation.

Mr. Wilder then offered the following resolutions in memory of Dr. Kirtland:

Resolved, That the members of the Massachusetts Horticultural Society, in common with the public, have learned with deep and sincere regret of the death of Jared P. Kirtland, LL. D., an old and highly respected Honorary Member of this Society.

Resolved, That though Dr. Kirtland had arrived at an age not commonly allotted to man, we regard his death as a national loss; the loss of one of the most learned and useful men that our country has produced, as a citizen, a man of science, or a scholar. Few have left such enduring memorials of industry, intelligence, and devotion to all that pertains to rural art, rural taste, and human

happiness, as he has left in his writings and teachings. Though he is gone, he still speaks to us in lessons of wisdom, and his works will bless his countrymen while there shall be among them a lover of the beautiful in nature, or a heart to advance the cause of science or the happiness of mankind.

Resolved, That we sympathize with the relatives and friends of Dr. Kirtland in this bereavement, and that as a token of our profound respect for his memory, these proceedings be entered on our records, and a copy thereof be sent to his family.

Charles M. Hovey said that his acquaintance with Dr. Kirtland commenced more than forty years ago, and that, besides receiving from him many communications for the "Magazine of Horticulture," he had kept up an interesting private correspondence with him. His experiments in horticulture showed him to be far in advance of the world generally.

Francis Parkman said that he became acquainted with Dr. Kirtland when he was seventy years old, and that he then appeared in the full vigor of life. He was a man of great energy and enthusiasm, yet these were always tempered with reason. He had a robust mind in a robust body. He was thorough in everything, and his experiments, especially, were exact, for they were conducted by an understanding naturally strong, and improved by careful training. No writer is so complete or so satisfactory in regard to the cultivation of the magnolia; indeed, the discovery of the advantage of grafting the *glauca*, and other species of smaller growth, upon the more robust *acuminata*, is due to him. He was such a man as our country needs, and one of the few whose loss in horticulture may be regarded as a national loss.

The resolutions were unanimously passed.

The President, as Chairman of the Executive Committee, reported a recommendation that the following appropriations be made for the year 1878:

For prizes, ...	$4,575 00
For the Library Committee, for the purchase of magazines and newspapers, binding of books and incidental expenses of the Committee,	225 00
For the Committee on Publication and Discussion, ...	200 00
For a portrait or bust of the President elect,	200 00
For a testimonial to the retiring President, .	150 00

The above appropriations were unanimously voted.

The President also announced the appointment by the Executive Committee, of Edwin W. Buswell as Treasurer of the Society, and Robert Manning as Secretary.

The following vote, presented by William C. Strong, was unanimously passed.

Voted, That the thanks of this Society be presented to our retiring President, Francis Parkman, for the valuable services rendered during his administration, and that as an expression of our appreciation of these services, a committee of three be appointed to procure and present to Mr. Parkman a suitable testimonial.

The Chair appointed as that Committee, W. C. Strong, C. M. Hovey, and Waldo O. Ross.

On motion of Hervey Davis it was

Voted, That the Prospective Prize of sixty dollars, awarded to John B. Moore, for the Moore's Early Grape, be paid out of the unexpended balance of the appropriation for prizes for the year 1877.

W. C. Strong, Chairman of the Committee on Discussions, announced that the Meetings for Discussion would be resumed on the next Saturday, at 11 o'clock, when J. W. Pierce would read a Prize Essay on "Ripening and Marketing Pears," to be followed by a discussion of the subject.

On motion it was voted that when this meeting adjourn it be to Saturday, January 19, at 11 o'clock.

Adjourned.

MEETING FOR DISCUSSION.

SATURDAY, January 12, 1878.

A Meeting for Discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following Prize Essay was read by the author, J. W. Pierce, of West Millbury, Mass.:

RIPENING AND MARKETING PEARS.

The pear stands next to the apple in the list of our most valuable domestic fruits, and its cultivation is rapidly increasing, while with many fruit growers there is a disposition to lessen the production

of apples, owing to their uncertainty and tendency to over production in years of plenty. Although the supply of pears has hardly been equal to the demand, and until within a few years they have commanded a high price,—and even now a superior article will bring a very satisfactory reward,—yet I apprehend that, provided we can successfully combat the blight, a few years hence pears will be as plenty and cheap as apples are in ordinary years. I notice that there are more young pear trees commencing to bear, and more pear orchards being planted than there are of apples, and that many orchardists are digging up their apple trees. Certainly *on soils adapted to their growth*, pears are surer and more productive, taken one year with another, than apples, and can be produced cheaper by the barrel.

But while the cultivation of the pear in favored localities is easier than that of apples, the proper ripening and marketing of the pear is attended with more difficulty. Indeed, there are but few people who know how to handle pears so as to ripen them in a way to obtain their best color and flavor, and to bring them to maturity at just the most desirable time; or having satisfactorily ripened them to put them into market in a condition to obtain the best returns. A good pear may be ripened so as to be solid, juicy, and sweet, with a good rich color to its skin, or it may be made corky, insipid, and rotten at the core; or again it may be shrivelled, sour, and unattractive, and these different conditions may all be obtained the same season, and from fruit grown on the same tree. This being the case, the importance of proper ripening will readily be seen. While different varieties may require slightly different treatment, owing to their individual characteristics and the season, yet the same general rules will apply to all. I believe that nearly all pear growers agree that all kinds of pears should be picked while green, and ripened in the house, but at just what time they should be picked, and just how they should be handled to ripen them, are subjects on which there is much diversity of opinion.

But in order that we may intelligently understand this subject, let us see what this ripening process is, and what are the conditions essential to its most perfect development.

Chemists tell us that about fourteen per cent. of the pear is soluble matter, and that it is composed of a trace of free acid, and twenty-three hundredths of one per cent. of albuminoids, and that the rest of the soluble matter is made

up of sugar, starch, cellulose, dextrine, and other farinaceous substances. Now this ripening process is a saccharine fermentation, and is analogous to the malting of brewers' grains. In malting, diastase is formed by a change of albumen in the grain, and this diastase acts as a ferment on the starch, gum, and cellulose of the barley, and changes a portion of these substances to glucose or grape sugar. In the ripening of pears, the vegetable acids which they contain, act on these farinaceous substances, of which the pear is so largely composed, and if the fruit is removed from the trees and kept at a temperature which favors this saccharine fermentation, its cellular tissues will be broken down, its water and aroma set free, and glucose or grape sugar will be formed from its farinaceous substances, giving us a sweet, juicy, high-flavored pear. Now what we want, in ripening pears, is to obtain the most perfect development of this fermentative process, but at the same time to avoid any vinous or destructive fermentation which would destroy the sugar or induce decay. We also want to have the fruit as large and plump as possible, avoiding any wilted or shrivelled appearance, and to obtain its best color—as much of bright straw color, with a tinge of red, as possible. Now how shall we make a practical application of these principles so as to obtain the desired results?

Summer and early fall pears should be picked just before they begin to turn, and when they are nearly grown; should be handled with great care, to avoid bruising, and should be placed in barrels or boxes in a room or cellar, where the temperature may be kept at about 70° and a moderate degree of moisture maintained. A very dry air is not so good, as it absorbs the moisture and aroma from the fruit, injures its flavor, and causes it to wilt and shrivel up. After being kept in such a room a few days they will begin to turn, and some of them will mellow; then they should be sold or used before they soften. The boxes, barrels, or whatever they may be placed in, should be covered with papers to exclude the light and prevent the escape of the aroma.

Care should also be exercised to avoid placing them so deep in barrels or heaps as to allow of the generation of much internal heat, which might carry the fermentation too high and destroy the fruit. When one has the facilities for doing so, he may improve the color, and possibly the flavor, by spreading them on shelves between old newspapers. This ripening between papers, on shelves,

in a room where an even temperature, and the right degree of moisture can be maintained, seems to give the most satisfactory results of any method with which I am acquainted. The manner in which early pears thus treated will color, is truly wonderful.

It is often desirable to lengthen the season of the ripening of some of our early pears; especially is this the case where the Bartlett—which seems to be the standard summer pear for marketing purposes—is the main crop. This may be readily done, by making two or more pickings from each tree, with several weeks between the first and the last picking. The largest and ripest should be picked first—as soon as the windfalls will ripen and be good—and the smaller and greener ones should be left to receive the additional sap which the earlier ones would have appropriated. Sometimes one side of a tree will be much earlier than the other, in which case the earliest side should be picked first.

This early picking should be ripened off at once by the process already described, only observing that the greener the fruit the higher temperature it will require, and a more humid atmosphere will be needed to prevent their shrivelling. Having ripened and disposed of this early crop, another picking should be made and served in a similar way, leaving the greenest on the trees as long as they will keep green. Mulching and, where practicable, watering, will help to prolong their season by keeping up the vigor of the trees. Most summer and fall pears may be kept best by leaving them on the trees as long as they will hang and keep green. I have tried keeping them on ice, but while it checked their ripening, it induced decay and destroyed the life of the pear, if I may be allowed such an expression. Certainly, keeping pears a long time at a low temperature injures their ripening properties. By making early and late pickings as described, we may obtain a larger crop from each tree and sell it at better prices, because we can put part of them into market early, before the bulk of the crop is received, and we can keep a part of the crop until quite late and sell when the rush is over, thereby obtaining better prices. Splendid specimens for exhibition purposes may be obtained by leaving a few of the largest and fairest specimens on the tree and picking all others early; then, when fully grown, pick and ripen between papers or blankets, as the weather and degree of ripeness they have attained on the tree may require.

A great many people pick their pears too green. Such pears

are small, and they will shrivel unless ripened with great care, and they lack the body and flavor of those which are fully grown. Late fall and winter pears should be left on the trees until hard frosts and windy weather cause them to fall; then they should be carefully picked, sorted, and packed in clean barrels and stored where the temperature can be kept as near 40° as possible until the season of ripening has arrived, when they should be placed between woollen blankets in a room where an even temperature of as near 70° as possible can be maintained, and they will soon ripen like summer pears.

I believe the cause of the failure of so many people to satisfactorily ripen winter pears is, that the fruit is kept and ripened at so low a temperature that the tendency to saccharine fermentation is destroyed, instead of being favored, and consequently such pears are dry and tasteless.

The *summa summarum* of this whole matter is, if we wish to keep pears and retard their ripening, we must keep them in a still dry air, at a temperature as near 40° as it is possible. But when it is desirable to ripen them, put them in a dark, warm place with a moderate degree of moisture in the air, and keep them covered to exclude the light and retain the heat and gases which are generated. In warm weather use papers for a covering, and in cold weather use woollen blankets.

Marketing. To the man who grows pears for profit, the subject of marketing is of paramount importance, but here is where many fail. They can produce first class crops in abundance, but fail to put them into market in the best shape and at just the right time. The best way to market a crop of pears depends very much on the quantity, the kinds, and the distance from market, as well as the individual tastes of the producer.

To one who has a large quantity of fruit to dispose of, and who is located some distance from a large market, or one who has not any taste or ability for marketing, I would recommend to ship them, while yet hard, to some reliable fruit dealer in one of our large markets. By so doing he may obtain his money in a mass and save a large amount of time. Pears sold in this way should be carefully sorted, discarding all ripe or wormy ones, as well as those which are knurly or undersized, and they should be packed in clean barrels, with a layer of choice ones laid on their side in the bottom of the barrel; then fill in a few carefully and shake down;

then more and shake again, and when even full after it is thoroughly shaken, press the head in, drive the hoops, and nail the head in, and line it with pieces of old hoops or green twigs; then turn the barrel over and mark the name of the party to whom it is to be shipped, as well as the kind and quality. If shipped before cold weather, or if nearly ripe, the barrel should have holes bored in it to admit a circulation of air and prevent the fruit from heating and rotting.

Great care should be exercised to use only clean, sweet barrels, and new ones should be used when they can be obtained. Pears will readily absorb odors from the barrel or whatever they may be packed in. Any substance which will absorb moisture, like sugar or salt, will induce decay. The value of a barrel is too insignificant when compared with that of the pears it will hold, to warrant the use of doubtful ones.

When small quantities are to be sold in a local market, it is better to put them out in a nearly ripe condition: that is when they just begin to turn, but before they are soft. When sold in this condition I know of no better way to handle them than to pack in shallow boxes similar to those used by market gardeners for the sale of vegetables. These boxes should be made to hold just a bushel or half a bushel each when even full, and the bottoms, for the sake of ventilation, should be made of battens three-fourths of an inch thick, and one and one-half inches wide, with three-fourths of an inch spaces between them. The bushel adopted by our government contains 2,150.42 cubic inches, and as pears as well as other fruits and vegetables are sold by heaped measure, which amounts to about five pecks even measure, we must add one peck to the standard, which will give 2,688 cubic inches in a heaping bushel. Now a box made eight inches deep and eighteen wide by eighteen and two-thirds long, will hold 2,688 cubic inches even full, and such boxes may be packed into a common market wagon side by side and as high as is desirable, without injury to the fruit. For pears which are quite ripe it would be better to use half-bushel boxes of the same dimensions, except in height, which should be only four inches instead of eight. In a four inch deep box, mellow pears may be safely transported quite a distance in a spring wagon.

Common baskets should by all means be avoided for handling ripe or nearly ripe fruit. They are not rigid enough; they are continually changing their shape, and a slight movement will jam the fruit more or less. Let any one who doubts this take a half-

bushel of pears to market, when they are nearly ripe, in a basket, and failing—as he ought—to sell them, carry them home again and see what they look like the next day. I do not know of any thing to hold fruit for market, that is more objectionable than a common basket. But pears packed in these shallow boxes, with openings in the bottom, may be carried to market, and if not sold can be taken home again without injury. For convenience of handling, these boxes should have holes cut in the opposite sides for handles.

Whether to sell wholesale or retail is a matter for each producer to decide for himself, and must depend very much on his quantity of fruit and distance from market, but it must be borne in mind that retailing takes a great deal of time, and can often be done more cheaply by a second party than by the producer.

Discussion.

On the conclusion of the Essay the Chairman called on Marshall P. Wilder, as the Nestor of pear culture. Mr. Wilder said that the maturity of fruits depends on saccharine fermentation, which is followed by the vinous and acetous fermentations. To prevent these, and preserve the fruit in all its beauty, freshness, and flavor, the temperature must be uniform, and be kept below the point at which fermentation, or the ripening process, commences. It was well said by his friend, Robert Manning, some years ago, that "the ripening of fruit is the completion of the chemical process by which starch is transformed into sugar, and is the first step toward fermentation and decay; whatever promotes fermentation will hasten the ripening; whatever retards fermentation will tend to its preservation."

The conditions of success in preserving and ripening fruit may be briefly stated to be the perfect control of temperature, light, and moisture. Various fruit houses and cellars have been built in this and other countries for this purpose, and all experience shows that these conditions must be complied with or success cannot be attained. Hence these apartments must be cool, and constructed so as at pleasure to exclude the external atmosphere. It is possible, however, to preserve the temperature at so low a degree, and so long, as to destroy, especially with some varieties of the pear, the vitality, and therefore all power ever to resume the ripening process. Experience proves that for the common varieties of the pear

about 40° of Fahrenheit is the temperature best suited to hold the ripening process in equilibrium.

The proper *maturing* of fruit thus preserved demands skill and science. Different varieties require different degrees of moisture and heat, according to the firmness of the skin, the texture of the flesh, and the natural activity of the juices. Thus, some varieties of the pear will ripen at a low temperature and in a comparatively dry atmosphere, while others, like the Easter Beurre, are improved by a warm and humid air. Some varieties of the pear, ripening with difficulty and formerly esteemed only second rate, are now pronounced of excellent quality, because the art of maturing them is better understood.

Mr. Wilder said that these remarks, like his own experience, had special reference to the apple and pear, though the principles laid down were doubtless susceptible of more extensive application. Fruits designed to be kept for a considerable time should be gathered with great care some days before the ripening process commences, especially summer pears. A summer pear ripened on the tree is generally inferior. In respect to these, Mr. Barry, when editor of the "Horticulturist," so aptly expressed the views of the speaker that he used his language: "The process of ripening on the tree, which is the natural one, seems to act upon the fruit for the benefit of the seed, as it tends to the formation of woody fibre and farina. When the fruit is removed from the tree at the very commencement of ripening, and placed in a still atmosphere, the natural process seems to be counteracted, and sugar and juice are elaborated instead of fibre and farina. Thus, pears which become mealy and rot at the core, when left on the tree to ripen, become juicy, melting, and delicious, when ripened in the house."

O. B. Hadwen thought that pears required much skill in ripening, and that but few varieties should be kept in the house at a time. With pears, as with grapes, the best results are obtained by those who give special attention to their ripening. The further he went in pear culture, the more he was convinced that to grow pears profitably not more than three or four varieties should be cultivated.

Robert Manning spoke of the opinion entertained by the late John Gordon, an extensive pear grower, that the color of pears was brought out better when they were covered with woollen cloths than when any other material was used. He had seen similar views expressed in print by others, and was led to suspect that the wool-

len cloths might possibly produce some specific effect in heightening the color of the fruit. He inquired Mr. Pierce's views on this point.

Mr. Pierce had not observed any special effect on the color from the use of woollen cloths. He had used them only in cold weather to keep the fruit warm.

Robert Murray had generally been successful in keeping pears, but this year they had not kept so well as usual. He put them in boxes and kept them in a cool place, and brought them into a warmer room to ripen them. The Winter Nelis was very fine, and ripened earlier than usual, though they shrivelled. The Sieulle dropped its leaves, yet the fruit ripened. In previous seasons he had kept the Beurre d'Anjou until March, but this year, with the same care, they were all gone two months before that time. He did not understand the cause of this difference in their ripening. He placed Lawrence pears in a box in a cold shop, and covered them loosely, and though they must have been frozen, in January every one of them was perfect.

Mr. Wilder said that his pears kept better this season than usual, though some, left out-doors in heaps for a time, shrivelled.

Mr. Murray said that he gathered his pears towards the close of October; last fall they remained on the trees longer than usual. He allowed no air to strike the fruit after it was gathered.

Aaron Davis Capen said that after planting his trees he did not force them, for he believed that some growers were forcing their trees too much, and he thought that his had done better than with excessive culture. He had a neighbor who cultivated to such an extent that the fruit was worthless. He was glad to hear Mr. Murray speak of his failures, for he had failed himself, but only through negligence. He had commonly left his pears out late—until the snow came; but this year he put them into the cellar earlier, where they were more exposed to air and warmth, and consequently decayed earlier. At a meeting of the Norfolk Agricultural Society held the last week in March, about eight years ago, he exhibited Passe Colmars in good preservation. He had kept Beurre d'Aremberg and Winter Nelis to the end of March, but this year the Winter Nelis were all gone the first of January. He had had very handsome specimens of Vicar of Winkfield, which he kept in the cellar, until they were wanted for market, when they were placed near a stove in a warm room and colored beautifully.

Mr. Wilder said that to ripen pears it is only necessary to bring them into a higher temperature—50° and upwards—and keep them from the light.

The Chairman asked whether better quality could not be obtained by special methods with some varieties, the Vicar of Winkfield for instance.

Mr. Wilder answered the Chairman's question in the affirmative.

Mr. Murray had never thought much of the Vicar, but this year he had some fine specimens, which were brought into the cellar near the furnace to ripen, and colored up beautifully, so as to look very tempting, but they were worthless for eating.

Alexander Dickinson had found that when proper care is given to it the Vicar is a nice pear. They are finer on quince stocks than on pear roots, but are apt to over bear on the quince, and must be thinned. If rightly handled they are one of the best pears —he thought more of them now than ever before ; when well ripened up they are nearly equal to Beurre d'Anjou.

Mr. Murray said that he had one tree and that was all he wanted. He considered it the most worthless of all pears.

Mr. Dickinson said that he kept them in a stable where it was cool and shady, and never picked them over until they were sold. When well ripened they look very much like Bartletts.

Mr. Wilder said that A. J. Downing once asked him what pear he would plant if he were restricted to one variety, and he replied "the Vicar." The Massachusetts Agricultural Club, after five years' discussion agreed on eighteen pears as most desirable for cultivation, and the Vicar was one. Messrs. Walker, Cabot, and Lovett, who were experienced pomologists, differed at first, but finally agreed. Mr. Wilder said the Vicar is sometimes all but first rate. It has more aroma than any other pear, and has sold for from two dollars and a half to three dollars per dozen ; but this, it must be remembered, was a long time ago.

E. W. Wood said that five years ago the Newton Horticultural Society recommended twenty varieties of pears, of which the Vicar was one, but there was a strong opposition to including it, and he then quoted the opinion expressed by Samuel Walker and just referred to by Mr. Wilder. But the speaker said he had never been able to grow it of good quality ; the trees, especially dwarfs, set a great crop, but his never matured so as to make a first class table pear. In January, 1874, Mr. Dickinson took the first prize for

winter pears, one of his varieties being the Vicar, and, in the accompanying statement, said that they had been kept in his barn covered with hay.

Mr. Dickinson said that this year he had kept them in boxes; he had never had another opportunity to keep them in hay.

Mr. Wood spoke of a gentleman in Quincy who asked fifteen dollars per barrel for his Vicars [Mr. Wilder said that he had sometimes got twenty dollars for his], and who meant to set out five hundred trees next year, but partly for stocks, as it is the best of all growers. It will grow like the Baldwin apple. He had had trees on the quince root make good pear roots in four years.

Mr. Pierce said that he would leave pears on the tree as long as he could safely.

Mr. Dickinson remarked that the Vicar should be planted on a warm gravelly loam, in a sunny place. It will not produce good fruit on a clay soil.

Mr. Capen formerly had a neighbor who thought the Vicar not fit to eat, but before he died he acknowledged its excellence. He had, himself, two trees, one of which never produced a good pear, and the difference could not have been caused by the soil.

Mr. Wilder said that his friend Dr. Burnett, while travelling in the West the present winter found Vicars selling for a shilling each, and as good as any pear. They were of California growth.

Fred W. Kelsey thought the whole truth in regard to the Vicar could be summed up in a few words—if well grown they are magnificent; if poorly grown they are worthless. The top of the tree should be kept open and thin to admit the sun and air.

Mr. Manning thought the soil a very important point. He agreed with Mr. Dickinson that good Vicars could not be produced on a cold, damp, or clayey soil; but on a warm soil, well exposed to the sun, they acquire a red cheek, and will "yellow up" well and be of fair quality.

John B. Moore said they would not always produce fruit of good quality on warm soils. He had plenty of sand and gravel, and had thinned the fruit and grown it large, and then had to sell them for one dollar per bushel. He preferred a first rate pear; the Vicar is simply a cooking pear. Mr. Dickinson would not say it is as good as Beurre d'Anjou or Winter Nelis. The speaker had had crops of forty or fifty bushels, and the quicker he sold them the more money he got. He meant to graft his trees with other varieties.

Samuel Hartwell had been unfortunate in ripening his Vicars until this year. He gathered the crop on the 10th of November, kept them in a cool room for about a month, and then carried them into a cool, dry cellar, and though they are now all gone, they were all eaten and were very nice.

N. B. White said that if no other pear could be grown he would plant Vicars. His soil was cold and he sold his Vicars for two dollars and a half per barrel. Thinning will make a difference, but people generally will not take the trouble to do it.

C. M. Hovey said that all the gentleman who had spoken were correct. Years ago, when we had not so many good pears as we have now, the Vicar was valuable, but now they are not worth carrying to market. California specimens have been sold for three dollars per bushel. He had Vicars as good this year as they ever were, but they will not compare with other winter pears, and can now be considered as scarcely worth growing.

Mr. Dickinson said that Mr. Hovey's soil had a clay bottom, and he did not think you could raise a good Vicar on it. The trees must be well manured and kept in a good growing state. If allowed to grow too thick there will be black spots on the fruit, which is very objectionable. He sold his this year for three dollars per bushel, which is about as much as he could get for anything.

The Chairman remarked that Mr. Hovey and Mr. Dickinson had run neck and neck in exhibiting pears for premium.

Mr. Wilder said that all the different opinions which had been expressed were honest. Mr. Dickinson's Vicars must have been better than Mr. Moore's. We do not say that it will succeed well everywhere.

Mr. Murray said that his trees grow on a warm, gravelly soil, and four years ago he had a bushel of fine ones, which about the middle of February he sold for four dollars; but the buyer afterwards told him he could not sell him any more of that rubbish.

Benjamin G. Smith did not consider it the best pear, but one of the best. His finest specimens were sent to the table and the others were used for cooking.

Mr. Hovey alluded to the fruit house built in Cambridge, on Professor Nyce's plan, some years ago, and said that he had never put any pears into it but once, as he had found that pears in winter are of no great value as a market product. Fruit kept well there, however, and Seckels were quite plentiful in our market and of good

quality as late as January, supplying the demand so that the Dana's Hovey would not command much more than half the ordinary price. So far as respects keeping pears the process is successful, but the value doubtful.

Mr. Dickinson said that the fruit house pays, and is a good thing if managed properly. Some kinds do better in it than others; among these are the Bartlett and Beurre d'Anjou. Beurre Bosc and Duchesse d'Angouleme will not do. Bartletts sold for five and six dollars per bushel, but they lose their flavor after a time. As much or more fruit is put into the fruit house as ever, but it is not managed on Prof. Nyce's system.

The Chairman announced that next Saturday William D. Philbrick would read a Prize Essay on "Bottom Heat."

BUSINESS MEETING.

Saturday, January 19, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President Gray in the chair.

The following vote was unanimously passed:

Voted, That the vote passed November 3d, 1877, concerning the Treasurer's Report, be repealed.

E. W. Buswell read his Annual Report as Treasurer, including the Report of the Finance Committee.

The following vote, offered by John C. Hovey, and seconded by Francis Parkman, was unanimously passed:

Voted, That the Secretary of this Society is hereby directed to keep a complete record of all awards made by the Committees on Fruits, Flowers, and Vegetables, in a book or books kept for that purpose; and that the Chairman of each Committee named is directed to furnish the Secretary with a copy of all awards immediately after each exhibition.

W. C. Strong, Chairman of the Committee on Publication and Discussion, presented the list of Prizes for Essays for the year 1878, which was read by the President.

Adjourned to Saturday, February 2.

MEETING FOR DISCUSSION.

The following Essay, for which a prize had been awarded, was read by the writer, William D. Philbrick, of Newton Centre, Mass.:

Bottom Heat—Its Benefits and Methods.

By the term "bottom heat," as used by gardeners, is described the application of artificial heat, of whatever kind, to the soil in which plants are grown, or in which seeds or cuttings are started into growth under glass, in the autumn, winter, or spring. It is called bottom heat to distinguish it from the heat of the air over the soil, which is maintained, in general, at a lower temperature than that of the soil. The temperature of the air is subject to considerable variation, incident to the effect of sunlight or of cold winds upon the glass, while bottom heat, or the heat of the soil, should be kept more uniform.

It is very difficult, during the severe weather of our winter and early spring, to start into growth tender and tropical seeds and cuttings, without the application of bottom heat. The earth must be maintained for weeks together at a temperature never less than 60°, even during the long, windy nights, when the thermometer outside may indicate several degrees below zero. If heat is applied by artificial methods only to the air over the bed, it is not found so easy to prevent the bed from becoming chilled by the cold earth underneath, which at this season of the year has a temperature of not far from 40°.

The benefits to be derived from the use of bottom heat, are limited almost wholly to the kinds of work mentioned above, and will be found to be less and less apparent in proportion to the hardiness of the plants or seeds with which we have to deal, and to be less and less needed as the warm weather advances.

Thus the gardener finds bottom heat essential in starting the seeds of early tomatoes, peppers, egg plants, cucumbers, and melons, and in rooting cuttings of coleus, fuchsia, heliotrope, verbena, and other tender plants in early spring; while the hardier lettuce and radish seeds, and cuttings of geraniums will grow more healthily without bottom heat as soon as the severe weather is past. Cuttings of all kinds are rooted in cool weather much more rapidly by means of it than is possible in any other manner.

This is because we wish to stimulate a growth of roots, before the growth of leaves, and to do this we need to keep the soil at ten or fifteen degrees higher temperature than the air over the bed. This relation of temperature of the air to that of the bed is not difficult to maintain in the cool weather of winter and early spring, and as this is the season when we wish to multiply our stock of bedding and other plants for spring planting, it is at this season that the gardener finds most use for his cutting bench. When the temperature is kept uniformly at the right point, the rapidity and certainty with which the cuttings root is astonishing. The soft wooded plants will root in about six days and the harder ones in ten or twelve, with a very small percentage of failures.

In order to prevent fluctuations in the temperature of the air by the bright sunlight in fine days in spring, it is usual to construct the cutting bench upon the northern side of the greenhouse, with a partition or shade to cut off the direct light of the sun, which would defeat our purpose by wilting the tops of the cuttings before they are rooted; such precautions in avoiding the sunlight are not needed, however, in starting seeds, as young seedling plants have roots enough to endure the heat, if well watered and aired.

Wherever bottom heat is used the evaporation from the surface of the bed is rapid, and frequent watering is necessary, especially in clear and windy weather. This should be attended to at least once a day.

When plants are hardy, or well established in their roots, and when the temperature of the bed in which the roots grow, and the air above it, are easily kept at a proper temperature for the requirements of the plants to be grown, there will be no advantage gained by bottom heat; but on the contrary it will be found to foster a tender, rapid growth, and the bed will need so much care as regards watering and regulating the temperature, that it is best to do without it whenever practicable.

The methods in use for obtaining and applying bottom heat, may be conveniently divided into two classes, depending upon the source of heat, whether from fermenting animal and vegetable refuse, or from fire.

Where fermenting material is chosen it is most common to make use of horse dung, either alone, or mixed with forest leaves, refuse hops from the brewery, or tan bark from the tan yard. Horse dung, fresh from the stable, is the best material known, and where

obtainable in sufficient quantity is generally used in preference to any other material; when it is very strawy it will be improved for heating purposes by an admixture of nearly an equal bulk of wet forest leaves, or of waste hops fresh from the brewery; but when the straw litter is not in excess, the manure just as it comes from the stable is in the best order for a hot-bed. It should be carted from the stable before it has had time to become heated to excess, and piled in a heap of several cords upon the farm, and when the fermentation has fairly commenced, but has not continued over two days, the manure will be in prime order for use.

As manure heat is almost exclusively used for working hot-beds, the method adopted by the best gardeners deserves description.

The bed is prepared in the fall, in a sheltered and well drained situation. The south or southeast side of a high fence is the best place; the land is prepared by enriching with manure and repeated plowing to work it fine. In November the planks are put down, the back plank being placed three feet from the fence. It should be twelve inches wide, and the front one ten inches wide; the distance between the planks should be six feet, outside measure, so as to be covered by three by six feet sashes. The front plank should be five inches lower at its upper edge than the rear plank, so as to give five inches pitch to the glass; the planks should be nearly level as to the length of the bed, as, when one end is higher than the other, the high end always works warmer than the other. The planks are held in place by stakes made of pickets four inches wide and one inch thick, sharpened, and driven into the ground by the help of an iron bar and maul, and nailed to the outside of the planks with tenpenny nails. The planks will need to be braced apart at intervals of one or two rods to keep them at the proper distance asunder, so that the sashes may fit closely.

The bed thus prepared is covered over with leaves, eel-grass, or other coarse litter to a sufficient depth to keep out frost; it can be uncovered and put in use at any time during the winter when needed.

It must be prepared a few days before wanted for use in order to get the manure working well and the bed warm. The preparation is done thus: the loam is excavated for six feet in length at one end of the bed until the pit is twenty to thirty inches deep below the top of the planks, the depth being regulated by the depth of manure and loam required, which varies with the severity of the

season and the nature of the plants for which the bed is intended. The loam taken from the first six feet in length of the bed is to be carted to the other end to be used in covering the manure on the last six feet. Hot manure from the heap should now be carted into the pit and carefully spread and tramped down; the depth required will vary from six or eight inches in spring to ten or twelve inches in winter. The loam from the next six feet in the length of the bed should be immediately thrown on to the hot manure, and sashes placed over it, and the excavation thus made filled with manure as before, and the process repeated until the bed is completed. The depth of loam thrown over the manure will vary with the work required, hardy plants, such as lettuce and radishes, requiring eight or ten inches for thrifty growth; while the depth needed for tomatoes, cucumbers, and other tender plants will be only six inches; the less the depth of loam used the more the heat of the manure is felt by the plants, and the more care will be required to water sufficiently often.

Where a considerable depth of manure is used with a light covering of loam, in preparing for tropical plants, the heat for the first few days is apt to be excessive, and care will be needed in airing the bed both day and night, to prevent destruction of the plants; the excess of heat generally passes off after the first week.

A well made hot-bed will retain considerable heat for six or eight weeks from the time it is started. The heat gradually subsides from the time of beginning, and this is not objectionable in the spring, when the weather is constantly growing warmer, and the bottom heat is less and less needed.

In the severe weather of winter, however, the hot-bed is rather difficult to manage, and unless fully twelve inches of manure is used the heat will sometimes become exhausted before warm weather comes and cause trouble. In fact a great deal of skill and care is required to run hot-beds sucessfully in winter.

When a constant temperature of 60° to 70° degrees of bottom heat is required in a greenhouse for a considerable time, the use of fire heat will be found much more convenient and satisfactory.

The smoke flue is the simplest form of heating apparatus, but is open to objection from the high temperature of the parts near the fire as compared with the more remote parts, and where large greenhouses are required, the heating is done much more satisfactorily by hot water pipes. Another objection to the flue is the risk of fire from the hot brickwork near the furnace.

Where bottom heat is to be obtained by fire it will be needful to box the flue or heating pipes, and the bed of earth or sand over the boxing is best supported by slate stones, which are both durable and good conductors of heat. The boxing should be provided with ventilators to be left open in severe weather when there is risk of freezing the house.

When it is desired to root a few tender cuttings, or to start tropical seeds in a greenhouse which is kept cool for the healthy growth of hardy plants, it can be easily accomplished by parting off a portion of the house with curtains of cotton cloth, so as to avoid airing the warm bed too freely when the rest of the house requires air. The bed can be kept warm readily by placing under it eight inches of hot manure as described for a hot-bed.

This plan is often pursued by those gardeners who raise lettuce and cucumbers in greenhouses; it is desirable to start the cucumber seed while the lettuce is growing, so as to have good cucumber plants by the time the lettuce is cleared away; the different habits of the lettuce and cucumber, one of which is impatient of heat, and the other of cold, render it difficult to accomplish the feat of making them thrive together without some such contrivance as that described above.

Bottom heat is not recommended for forcing lettuce in greenhouses as was the practice some years ago, experience having proved that it grows better without it.

Discussion.

F. L. Harris said that all gardeners are advocates of bottom heat, but that we lose a great deal by using cold water for watering. He would have the water twenty degrees warmer than the atmosphere. Instead of using it at 38° or 40°, the usual temperature of cisterns, he would have it from 70° to 80°. Mr. Harris pointed to a remarkably fine plant of *Cœlogyne cristata* exhibited by him, and said that he would on no account use water of the temperature of an ordinary cistern to water it. He regarded this point as of the highest importance.

John C. Hovey thought every cultivator should understand the rule that in watering any plant the water should be of the temperature of the natural habitat of that plant.

Mr. Philbrick said that the point is well understood by gardeners.

He draws water from the heating pipes, choosing a time when the temperature is from fifteen to twenty degrees above that of the atmosphere. He had known beds worth hundreds of dollars spoiled by the use of cold water.

H. Weld Fuller spoke of a simple apparatus which he uses in the greenhouse at Woodlawn Cemetery to take the chill from the water in an elevated cistern. It consists of a coil of annealed copper pipe, placed around the smoke funnel of a Hitchings boiler, outside and at its base, there connecting with a half-inch lead pipe which leads down from the bottom of the tank, while the upper end of the coil is connected with a lead pipe extending into the higher portion of the water in the tank, and there by a movable coupling, carrying the heated water to a float with a downward finger-vent which is always under the surface and rises and falls with the water in the cistern to keep up the greatest circulation, the principle being the same as that which keeps up the hot water circulation in our kitchen ranges. In this case, nine coils of half-inch pipe, rising slightly at each turn, accomplished the heating perfectly, the whole costing less than eight dollars.

James Cruickshanks corroborated what Mr. Harris had said. He had been astonished where water was drawn directly from a faucet, that plants should succeed as well as they do. He recommended a tank of soapstone, in which the water will, in twelve hours, acquire the temperature of the house.

W. C. Strong said that while all would agree to the principle laid down by Mr. Harris, there is a limit to its application. He had visited a successful cultivator of roses, who cut a full crop at Christmas and Easter, from plants the roots of which were in the outside ground where they got all the rain. The case is the same also with forced grapes. He believed that many plants are not as sensitive as might be inferred from what had been said, but have sufficient constitution to endure showering with cool water and are refreshed by it. He did not include among these, however, the delicate plants cultivated by Mr. Harris, but the majority of plants generally cultivated, for which he thought warm water unnecessary.

Mr. Hovey asked if the borders for forced grape vines were not generally covered, and referred to the production of three crops in two years by M. H. Simpson, who covered his borders thickly with wool waste, over which boards were placed to shed the rain. The covering was put on in July, when the temperature of the soil was highest.

Mr. Strong said that with the temperature of soil at about 42°, grapes could be forced without covering the border. He had ripened a ton in May, with only a covering of manure. We can stimulate the growth of plants by using warm water.

Marshall P. Wilder was gratified with the remarks of the last speaker. He had, himself, no roses in his greenhouse, except those planted on the outside, and as he covered the border only a few inches in depth it must frequently be frozen, and a portion of the roots must be frozen. The old rule was that water should be kept in tanks until it acquired the temperature of the atmosphere before watering, and he disapproved of pumping up cold water and immediately using it indiscriminately on all plants. He was pleased with the remarks of the essayist in regard to flues; he had used no other method of heating his cutting beds, except experimentally.

N. B. White asked, Will plants thrive in frozen earth? Are they not conductors of heat, and do they not thaw the soil? It seemed impossible to him that a plant could grow in frozen soil.

M. H. Merriam came in feeling much interest in the subject of the discussion, and wanting to know the principles which govern the application of bottom heat; but while the essayist and others had given us many interesting facts, they had not given us the principles which underlie those facts, and which the speaker thought highly important that we should understand. The ripened wood of roses is not treated the same as soft wood, and what we lack is a knowledge of the philosophy which controls propagation by cuttings of different degrees of maturity, and accounts for this difference in treatment. If the novice attempts to learn from books, he will find that they disagree; some say that the temperature of water is of little consequence, while others consider it of great importance. The speaker believed in the individuality of every plant. The conditions under which a plant grows naturally are to be considered. Nature propagates mainly through seed, while propagation by cuttings is an artificial method, and we must inquire into the conditions under which it is best effected, and apply our best resources to bring about these conditions. He had had experience as an amateur in propagation by cuttings, and had been flatteringly successful. His propagating bed was on a bench with hot water pipes underneath, closely enclosed; the bed was also enclosed above, and had ventilators to control the admission of air above and below. Out of one thousand cuttings of Bon Silene rose he

had potted seven hundred, and had rooted five hundred carnations with no failures to speak of.

Mr. Philbrick thought that the last speaker might fairly claim to understand the theory of propagating by cuttings, and the use of bottom heat. For tender seeds, such as cucumbers, the earth should be kept at a temperature of about 70°; for lettuce at about 50°, and for radishes at a little less. A cutting is a plant in an unnatured state, and we want to stimulate the production of roots before leaves; after that is effected it will grow anywhere. If the leaves are not removed when the cutting is made, the plants will go before you know it.

Mr. Merriam understood that the object of bottom heat was to furnish a stimulus to the cutting; but the question is, how much to each plant, and to the same plant or cutting in different conditions of maturity, for it will require different treatment under different circumstances, *i. e.*, of maturity. Ripened wood, it is generally thought, will not bear as much bottom heat as soft wood. For green cuttings of roses a bottom heat of 50°, and overhead 45°, is right.

Mr. Strong, as Chairman of the Committee on Discussion, announced that next week Mr. Philbrick would read a paper on "Irrigation."

MEETING FOR DISCUSSION.

Saturday, January 26, 1878.

A meeting for discussion was holden at 11 o'clock, President Gray in the chair.

The following essay, for which a gratuity was awarded by the Committee, was read by the author, William D. Philbrick:

Garden Irrigation—Its Advantages and Limits.

The watering of gardens has been practised from the most ancient times of which we have any authentic record, to the present day; in fact, the beginning of irrigation dates back much earlier than authentic history. It was practised by the ancient Egyptians long before Herodotus described their wonderful water-works, and Damascus, the oldest city of the world, owes the very existence of

its gardens and the subsistence of its population to the practice of irrigation. In this country, too, the first Spanish invaders of Mexico and Peru found a very elaborate system of aqueducts in use by the Aztecs, which has since fallen into decay in consequence of the neglect of the miserably indolent people who have now possession of those countries.

It is not, however, the purpose of this paper to discuss the interesting history of irrigation, or to show, as might be done, that its practice is one of the best signs of enlightened industry and civilization; but to call attention to some of the practical questions connected with it in New England today.

These questions naturally present themselves in the following order, viz.:

1st. The amount of water required for successful irrigation.

2d. The sources of supply.

3d. The means of application, and of distribution of the water over the land.

4th. The advantages and limits of irrigation.

1st. *The Amount of Water Required.* The amount of water needed by vegetation during the growing season, for a full crop of most kinds of useful or ornamental garden products, is variously estimated by different authorities; the requirements themselves are very different under different circumstances; a loose, sandy soil will require much more water to irrigate it than a retentive clay or a peaty intervale; and some kinds of vegetables, like celery and cauliflowers, require much water; while many others, like corn, beans, and the grains, will endure considerable drought without injury. Much also depends on the temperature of the air, and the velocity of the wind, as well as on the more evident and important considerations of rainfall and atmospheric humidity.

In general, however, it may be assumed that, in the warm, growing months of May, June, July, August, and September, most vegetation requires an inch in depth over the entire surface of the land every five days. This is, of course, only an *average* amount; sometimes less than half this amount will be needed, and sometimes much more.

This amount estimated as needed by our gardens, would be equivalent to six inches per month of rainfall; if we compare this amount with the actual rainfall, we shall arrive at an idea of what is to be supplied artificially.

The rainfall at Boston, as observed by the Superintendent of Sewers, for the past six years, for the five growing months above named, varies from a maximum of 10½ inches in the month of August, 1872, to a minimum of 0.65 inch in June, 1873. During these six years there was not a single year when we did not suffer more or less from drought during some portion of the summer. Twenty-one of the thirty months in question had less rainfall than six inches per month, and the average of these twenty-one months was but 3.02 inches per month, or only about half what was needed for a full crop of garden products. Some of the protracted seasons of drought were almost entirely rainless for six weeks, during which the weather was excessively hot and windy, and vegetation suffered extremely in consequence.

2d. *The Sources of Supply.* Many gardens are so situated as to be able to draw upon the public water-works for a supply. The gardeners of Arlington and Winchester, and many other towns, have found this a very convenient and profitable method of watering their gardens, and in general where the water rates are not excessively high, and where the gardener has not at hand a cheap, natural source of water, the public works will be found both convenient and reliable. There are, however, many farms and gardens beyond the reach of the public water-works, where private works might profitably be erected for irrigation. As above noticed, however, the amount of water required for any satisfactory result is very large, and before embarking in any enterprise of this kind, it would be best to make sure that the source can be depended upon for a sufficient supply *in the driest seasons;* for it is precisely at such times that most water is needed.

Springs and wells are entirely inadequate to furnish water for anything more than a small patch of garden. The only sources to be depended upon for any considerable amount of irrigation, will be found in rivers, lakes, and ponds. There are few gardens so favorably situated that the water can be drawn by canals or ditches directly from some pond or stream to irrigate the surface. Where this can be done, it is by far the cheapest method, and it is in this way that the extensive irrigating works of Lombardy, Spain, France, California, and Colorado are constructed.

Where this system is adopted, considerable expense will be required to grade the land into beds or levels, so as to distribute the water easily and evenly; but once done, the water is afterwards

applied at a very trifling cost, — so cheaply that it is used for all farm crops in Lombardy and the south of France.

In most gardens, however, the supply of water, if any can be found within reach, will be at a level too low to reach the land without pumping, and a few suggestions will here be in order as to the best methods of pumping, which brings us to the next division of the subject.

3d. *The Means of Application and Distribution over the Land.* It will be seen at once by any practical person that it would be futile to think of distributing 27,000 gallons of water, or 108 tons to every acre, by means of watering carts. Not only would much time be required, but the land would be badly beaten down by the cart wheels, which would also injure the growing crops. To distribute the water by tiles, laid a foot below the surface, to escape the plow, would be ineffectual, only wetting the subsoil and wasting much water, which would soak into the subsoil or drains.

The only method of distributing water much used in gardens where pumping is practised, is the system of iron pipes laid underground, with hydrants distant two hundred feet asunder, from which the water is distributed by one hundred feet of india rubber hose. This is also the plan adopted by the gardeners who make use of the public water supply.

In this method of applying the water, it is not necessary to grade the land with reference to running the water in nearly level ditches, as must be done where the open ditch system is used. Where the land is undulating, as is mostly the case with our garden land, it will be desirable to carry the lines of pipe along the high ridges and headlands as much as possible, so as to enable the gardener to let the water run down the grade of the land between the rows of the crops to be watered. This will be found more expeditious and less laborious than carrying the hose down the rows and sprinkling the whole surface from the nozzle of the hose; the latter method, however, is sometimes used where the land is very uneven, and where furrows for running the water cannot conveniently be made between the thickly planted rows of garden crops.

Where the water has to be pumped and distributed by hose and sprinkler, it will be found good economy to use a powerful pump, that will give a head of at least thirty feet, and to use for distribution, pipes of not less than one and a half inches diameter, provided, of course, that any considerable area — an acre or more — is to

be watered. Thus, for example, we will suppose that it is required to water five acres of land, and that we have near by a never-failing pond or river; we can locate a steam pump near the river, and while at work watering we load the safety valve upon the delivering water pipe at fifteen pounds per square inch, which corresponds to a head of about thirty feet of water. We have three hundred feet of iron pipe, two inches in diameter, and one hundred feet of india rubber hose, one and a half inches in diameter, for delivery of the water; this apparatus would be capable of delivering forty-five gallons per minute, or twenty-seven thousand gallons per day of ten hours; enough for the thorough wetting of one acre per day, or every acre of the five once in five days; by running nights, ten acres could be watered with this apparatus.

Where it is only desirable to water a limited area of land—less than an acre—the windmill furnishes a cheaper source of power than the steam pump. To make it available, however, large storage of water must be provided at a high level, so as to admit of keeping the mill at work during stormy weather and storing the water until needed. A windmill for pumping, costing, with pump and tank, about $500, will furnish water enough for the irrigation of one or two acres of land, provided storage can be supplied at a high level for 200,000 gallons of water. To provide this storage might cost as much as to provide steam pumps; and any decision with regard to details of this kind, would depend upon the varying circumstances of each particular case. It is only proper here to call attention to the fact that where elevated reservoirs can be easily made, and the amount of water needed is not over 10,000 gallons daily, the windmill is, without doubt, cheaper power than steam; when the amount of work to be done is much larger, steam is in general to be preferred.

4th. *The Advantages and Limits of Garden Irrigation.* This question resolves itself into the practical one of whether it will pay to irrigate gardens; of course gentlemen who have almost unlimited funds to spend upon their pleasure grounds, understand the advantages of irrigation as a garden luxury, and will have water at any cost; it is here proposed only to consider briefly how far a practical gardener, who makes gardening his source of living, can afford to irrigate. This will depend first on the cost of water.

Water is supplied by the public works in some of our cities at 25 cents per thousand gallons. This is a rather high rate; at this

price it would cost to apply 27,000 gallons to an acre $6.75 for the water and about $3 for the labor,—say $10 per acre for each watering; and as each acre would generally need at least ten or twelve such waterings in a season, water applied in this way in sufficient quantity would cost from $100 to $125 per acre. There are some crops raised upon our market gardens which would warrant an outlay like this, but they are few. Early cucumbers, lettuce, celery, and cauliflowers may be mentioned as examples. These crops frequently sell for $1,000 per acre, and are sure to sell at the highest prices in time of drought, so that it is safe to say that where water is to be had at this price, the gardener would be warranted in applying it to his hot-beds and greenhouses, and to his most valuable field crops, in time of drought. This, however, is a high price to pay for water. It could be pumped and distributed by windmills or by steam pumps at about half this cost in very many favored locations, and then the use of it would be extended to crops of less value. The application of water to gardens has not, however, been practised in this neighborhood long enough to enable one to estimate very accurately where it would pay and where it would not; but it is well worth careful study by those who raise valuable crops of vegetables and small fruits.

Those lands which are naturally so situated as to be commanded by a good natural supply of water at such level as to be easily applied by a system of canals and ditches, are rarely to be found in those highly cultivated regions where gardening is practised; the cost of water under such circumstances is reduced to a minimum, and by grading the land for the purpose of distribution without pipes, the yearly cost for water has been reduced, in some cases, as low as from one dollar to three dollars per acre per year. Under such circumstances and in the dry climates of many parts of the world, irrigation is universally applicable, and even essential, to the growth of grass, grain, and all kinds of vegetables. This is, however, not garden irrigation and can receive here only passing notice.

A very important consideration, wherever irrigation is practised, is the drainage of the land. Wherever this is not naturally perfect, it must be made so artificially before irrigation can be safely practised, otherwise if a heavy fall of rain should occur just after an artificial application of water the crops might suffer seriously from being too wet.

Discussion.

Benjamin P. Ware said that the subject of the essay was one of great interest to him. He tried an experiment in irrigation last summer, which though not successful in every respect, was instructive, as even failures are. He has on the sea-shore a large house for summer boarders, accommodating from one hundred to one hundred and twenty-five persons, and the question of the disposal of the sewage is a serious one, both from a sanitary and an agricultural point of view. He built a cesspool three feet deep, four feet wide, and five or six feet long, into which all the waste water from the kitchen, chambers, and laundry was discharged by a cement pipe of the Bloomingdale pattern. From this a three inch pipe led to the vegetable garden, running along the side of the garden, and opening into lines of drain tiles laid across the garden at intervals of ten feet. It was presumed that through the joints between the tiles the sewage would moisten the soil above, and it was hoped to ascertain the value of sewage as a fertilizer. The apparatus worked very well; if at any opening the flow was too great it was checked by placing a piece of tin over it. The crop was a variety of family vegetables, but Mr. Ware did not find their growth any better along the lines of tiles than elsewhere, and was led to question the value of sewage. The impurities were mostly absorbed by the soil. In the course of the season a large quantity of grease was deposited from the sewage, the cesspool being nearly filled, and the openings in the drain tiles where the water soaked out also became choked with grease. He proposed to take up the drain tiles and continue the pipe to a slope of grass ground, and let the sewage flow upon the surface. He had great hopes that in this way it would prove beneficial.

Mr. Ware described a method, which he had practised, of making a pipe, for conducting water or sewage, very cheaply. He provides a pole ten feet long, three and a half inches in diameter at one end and three inches at the other. The material of the pipe is one part cement, and two parts coarse sand or fine gravel. After digging a trench to the required depth, cement is placed in the bottom to the length of the pole, and on this the pole is laid and covered two inches thick with the cement; in from five to eight minutes the pole should be twisted round, and a few minutes later, after the cement has set, it should be withdrawn, and another length of pipe made. With good cement it takes fifteen or twenty minutes

to make one length, and two men can lay one hundred and fifty feet or more a day, at a cost of three dollars. One of these pipes laid twenty-five years ago is now a solid stone.

Mr. Philbrick inquired whether Mr. Ware's vegetable garden was well drained.

Mr. Ware replied that it was not drained artificially, but the soil was of such a character as not to require it.

Marshall P. Wilder said that he had been extremely interested in what Mr. Ware had said, and spoke of the method of irrigation in use at Salt Lake City by open channels, into which the water is admitted, or from which it is stopped, by a shingle. The effect of water on the surface is different from that of water under the surface. Air and water are the two great promoters of vegetation. The grease which accumulates from sewage is an absolute injury to vegetation.

C. M. Atkinson was doubtful of the advantages, for drainage, of the pipe described by Mr. Ware, porosity and joints being needed in drain pipe, but it would make an excellent conductor. He had put down five hundred miles of drain pipes, and this winter had a piece of retentive soil to drain, in which he dug trenches and laid board drains in the form of the letter A, with a board bottom. When the boards have rotted they will leave the drain perfect, unless tree roots fill it. He thought that Mr. Ware had no right to expect his sewage to benefit his vegetable garden, for water will run down, and believed it would produce a much better effect on the grass.

Mr. Ware said that the pipe which he described was not intended for drainage, but for conducting water for irrigation—from a pond, for instance. It might be made to answer for drainage, but would not be as good as ordinary drain tile.

John B. Moore said that irrigation was very important where a proper supply of water could be obtained. He had studied this subject carefully, and if there was anything that he was proud of, it was his success in irrigation and drainage. He was not surprised at Mr. Ware's failure; the water would not go ten feet from the outlet before soaking into the ground. He thought it would be better to apply sewage on the surface, but if it will not make vegetables grow how will it make grass? The natural way of watering is by rain, and no one has yet improved on it. He had used water for artificial irrigation for two or three years, and by

means of it had made light, sandy loam productive, and succeeded in raising pears where he supposed it was impossible to grow them. Now that he has got water he needs manure. It is injurious to apply water in large quantities without drainage. The summer before last his sweet peas stopped blooming in July, and he let so much water on to the ground that when he attempted to walk on it he sank eight inches. The peas began to bloom again and continued until frost. He did the same last year, but they must have plenty of manure as well as water. He did not think it would pay to use water at the rate of twenty-five cents for a thousand gallons. He gets his supply from the Concord water-works, which have a hundred feet head. The Water Board can furnish water at low rates, and are ready to make liberal terms with gardeners. He did not believe it would pay to use water through a meter. No crop takes the moisture out of the soil more quickly than strawberries, and for these and other crops which soon suffer for want of water he lets the water run down the rows all night from half a dozen large pipes.

Mr. Wilder said that the secret how Mr. Moore produced his large strawberries had now come out, and that Mr. Moore did not sell his brains with his plants.

N. B. White had used sink drainage without perceiving any good results from it, and would rather have pure water than greasy matter from a cesspool, unless enough alkali were added to it to cut the grease.

James Cruickshanks spoke of the method of disposing of sewage in Edinburgh, where it is collected in a tank with a gate made so as to lift and let out the contents of the tank on mowing land. In this way five or six heavy crops were raised in one season.

President Gray said that the best crop of grapes he had ever seen was from vines watered with soap suds.

Mr. Atkinson said that the alkali used in making soap disintegrates the grease so that it would have a good effect on vegetation. When he succeeded Mr. Oldaker as gardener, he applied all the wood and coal ashes made in the house to the garden. This contained little bits of fat which were neutralized by the alkali of the ashes, and he thought that when thus neutralized the more of animal matter there was in manure the better.

Mr. Moore asked if the grease could properly be called grease after being changed by mixture of alkali.

Mr. Cruickshanks said that twice within ten years his sink drains had been so filled up with grease that he had been obliged to open and clean them.

Leander Wetherell remarked, in reference to the allusion that had been made to grease or oily matter as a fertilizer, that Prof. Stockbridge quoted William Cuthbert Johnson on this subject at the Winter Meeting of the Connecticut State Board of Agriculture, as follows: "He highly recommended for growing turnips, train-oil, and whale-blubber as manures. He mixed each with loam and then mixed ground bones with loam and each of the former two produced double the crop of turnips that the latter (the ground bone) did." Prof. Johnson of New Haven said, referring to the above quotation from Mr. Johnson of London, that it was the animal matter and not the oil that acted as a manure on the turnip crop. Reference having been made to the flesh of dead horses as a manure, Mr. Wetherell remarked that it did not act as manure or serve as food for plants until after putrefaction had taken place. He added that the same is true of blood. He referred to irrigation as introduced by Mr. Copeland, in Bridgewater, on quite an extended scale, he (Mr. Copeland) using iron pipes for conveying water where wanted for distribution on his garden grounds. He spoke of the beneficial effects of irrigation of grass land without manure. Light, heat, air, and water are the great factors of vegetable growth. Neither grease nor oil is a manure or fertilizer.

W. C. Strong said that the crops in New England cover the entire year and are as diversified as in any portion of the globe. He had two ice ponds, one of which was lower than the other, and this suggested to him the idea of winter irrigation. By letting the water from the higher to the lower, when the latter was frozen over he planned to thicken his crop in coldest nights. But he found that the water did not flow over the whole surface, but sank the ice in spots, unless carefully directed. The same mistake was made in irrigation so that the ground became sodden in one place, while the rest received no benefit. He thought that a considerable part of the benefit of irrigation arose from showering the foliage, especially at night, as in a greenhouse. The coolness is a positive benefit, and warm water would be injurious to carnations and many other crops. Distributing evenly is very important.

Mr. Philbrick said that he applied water in the sunshine sometimes, but that in general he did not like to. He preferred the

afternoon. In winter he waters in the morning to avoid mildew. Ordinary greenhouse plants will stand cold water, but it would be often fatal to tropical plants or to other plants in a tender state. He thought that grease injured only by filling the pores of the soil and preventing the circulation of air. Soap is different; the alkali possesses fertilizing properties. The benefit from dead horses arises not from the grease, but from the other animal matter.

E. P. Richardson had found a hose perforated with holes an eighth of an inch in diameter, and about three or four inches apart, very convenient for applying water. It can be led any where, in a straight or crooked line, and under plants which are injured by watering on the leaves in bright sun. His ground is sloping, and the water delivered from these small holes, will run down hill without washing. Such a hose may be left for hours without attention.

BUSINESS MEETING.

Saturday, February 2, 1878.

An adjourned meeting of the Sōciety was holden at 11 o'clock, President Gray in the chair.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

John C. Phillips, Jr., of Boston.
Hamilton Stevenson, of Woburn.

C. H. B. Breck, Chairman of the Committee of Arrangements, stated that his annual report for 1877 was not ready, and on motion of Hervey Davis it was voted that it be published without being submitted to the Society.

The President read a communication from Hon. William G. Le Duc, United States Commissioner of Agriculture, requesting models of fruits, etc., for the Paris Exposition. On motion of John C. Hovey the communication was referred to the Fruit Committee.

The President read a communication from Jonathan Periam, Secretary of the National Agricultural Congress, requesting the

Society to send delegates to the meeting of that body at Washington, on the third Tuesday in February.

Voted, That it is inexpedient to send delegates.

The President also announced a letter from Charles Pease, of East Rockport, Ohio, acknowledging the receipt of the resolutions passed by the Society in memory of his father-in-law, the late Professor Kirtland.

Adjourned to Saturday, March 2.

MEETING FOR DISCUSSION.

This was opened by the following essay, by William H. White, of Westborough, for which a gratuity was awarded by the Committee on Publication and Discussion, and which was read by E. W. Wood:

The Culture and Varieties of Roses.

Botanists enumerate some eighty or more species of the rose, while florists give us an almost innumerable number of varieties, of which but few are adapted for the general cultivator in any given soil and latitude. To enumerate the species and varieties does not come within the province of this essay, but it may be well to state a few of the leading characteristics of what I consider a fine rose, whatever the species or variety. Excepting the Moss rose, all varieties should possess foliage of a bright shining green, which color, to be perfect, needs to be permanent, although not likely to be found in many varieties, my preference being for a sort of evergreen foliage. However size, form, etc., may vary in different varieties, uniformity in the same variety is desirable. A fine rose is one which is rich and beautiful in all its stages of bud and blossom, up to, and previous to wide and full expansion. Single and double flowers, while enclosed within their calyxes, are alike beautiful up to a point where they expand to hide the calyx; but the double possess that characteristic which makes them magnificent when full blown, while the single are best shown previous to full expansion. Whatever difference there may be otherwise, the petals of all roses should be thick, broad, and smooth at the edges. The bud and blossom should possess fragrance, and the higher that fragrance the more valuable the variety. The flower should be double

to the centre, high on the crown, round in outline, with regularly disposed petals. The peculiar characteristics of any and all varieties should be strongly and fully developed in each flower.

Roses are cultivated in the open air, in the house, conservatory, etc., all of which naturally come within the province of an essay on the culture of roses; but that we may embrace the whole within circumscribed limits we must necessarily touch but briefly on minor details.

Soil. The proper soil for the rose is a strong, rich, friable loam, well drained naturally or artificially, neither too moist nor too dry, but with such a degree of moisture that the plants will never suffer from want or excess. But we are commonly restricted to "Hobson's choice," and provided with soil, such as we are obliged to use, already made. Such being the case we must supply any deficiency to the best of our ability. By aid of the present lights of science, and a little labor, we are enabled to largely modify and ameliorate almost any soil, often changing its entire character, and remedying defects in climate, etc. A fine rose cannot be grown in uncongenial soil, therefore it is idle to expect it. If the soil is poor or illy adapted, the blossoms will be but imperfect, perhaps radically different from those grown in soil well adapted to bring out its strong points. Thorough drainage is essential, and where this is had there is little danger of having the soil too rich; and even when it may be thought sufficiently rich, the addition of a little well decomposed manure or compost will be advantageous. There is no fertilizer better adapted for the rose than decayed turf from an old pasture—the older the pasture the better—mixed with old cow manure; and especially is this invaluable in pot culture, where the cow dung should be in excess of that needed in out-door culture. I have grown and blossomed roses in clear cow dung, which has lain out and was gathered from pastures, and pulverized when dry, but I think a portion of soil, to give cohesiveness, is better. Recollect that the best of soil and careful attention is the price of successful rose culture, and that the soil is just what we have the will to make it, when it is otherwise than an appropriate one for the rose.

Manures for the Rose. Roses are high livers and like food in plenty; a meagre diet will not answer the demands of a fine rose. Of all animal manures that from the cow seems to be the best adapted to the wants of the rose, but the manure, from whatever animal it may be, should be well rotted or decomposed, and be well

incorporated in the soil. Thin turf, from an old pasture, well decayed and mixed with the manure, several times turned, is one of the best of rose fertilizers; another good one is composed of one part Peruvian guano, three of decayed turf and six of cow manure, all well mixed and made fine. The turf should be from some rich old pasture, just thick enough to embrace the main part of the grass roots. Pig dung, soot, and wood ashes, are each and all good, when composted or applied as top-dressing and well worked into the soil. All manures should be administered in allopathic, instead of homœopathic doses. Soapsuds are excellent fertilizers and renovators, applied to root and branch. Solutions of guano and other manures in water are excellent, and are generally best applied at night or just before rain. If applied to the roots at any other time the top soil should be removed, making a sort of basin around the stem, the liquid poured in and the soil returned; in this way no crust forms on the surface.

Planting the Rose. Tender and half-hardy roses, when planted in the open ground, should be planted only in spring; the hardy sorts may be planted either in spring or fall, although I prefer spring planting. It should always be early spring or while they are dormant when the plants are set. Tea-scented and other tender sorts should not be planted out-doors until the danger of spring frosts is past. To plant a rose properly the roots require the first attention; every bruised, ragged, or torn root should be cut off smoothly above the wound; tap or downward growing roots should be shortened to discourage downward growing: cut back the top at least one half, if not already done, in order to keep the balance. Have the holes dug sufficiently large to receive the roots when fully spread; loosen up the ground in the bottom, and mix in several inches of rich surface soil for the rose to stand in and over. Place the plant in the centre of the hole, so that its collar will stand even with the level surface of the ground, unless it be a budded or grafted one, when it should be set deeper: then fill in the rich soil so that every root and branchlet of root shall be closely embedded therein; the soil should come in close contact with every portion of the root, for on this depends the success of planting. Moderate firming of the soil, only sufficient to hold the plant firmly, is all that is necessary, when the soil is in contact with the whole root. Unless the plant is of the dwarf sort, a stake should be firmly set and the plant tied to it. The mode

of planting, whether singly, in groups, or in beds, must be governed by the circumstances of the individual planter, but does not in any way affect the manner of setting in the ground. If planted in groups the taller growing are best set in the centre, or in the background, grading downwards to the outside; if in rows they should be at proper distances, so that each shall form a specific object in itself, as well as a portion of the row. Planted singly on the lawn they form beautiful objects, and ought to be each distinct from the other, blooming at different periods; but where set in clumps or beds they make a greater show to blossom at the same time. The situation for planting roses, especially the tall growing sorts, should be one somewhat sheltered from strong winds, and the trellises or supports should be set out before planting, and be firmly fixed in the ground.

Pruning. The pruning of out-door roses is best performed in March or April, and must be in accordance with the habits and requirements of the particular variety. While some do best with only moderate pruning, others require to have one-half or two-thirds of the last season's growth removed; but with all pruning a well shaped top should be kept in view; this can be attained by a combination of cutting and tying to position. The terminal bud at the cut should be left in the position which will most readily promote the growth of the desired form; for instance, if a more spreading form is desired, cut so as to leave the bud on the under or outer side; if a compact or upright head is sought, the reverse course should be pursued. Strong, healthy wood is always desirable, therefore in pruning cut out the weaker, reserving the strongest to make the new growth from. Always prune with a definite and fixed form or object in view. Vary the pruning with the requirements of the different varieties, and also for the positions they are to occupy, whether as standards, over pillars, flat trellises, walls, etc. If you desire quantity, regardless of quality in bloom, cut and disbud sparingly; but if quality is the first object, cut out all weak wood, and then cut away all wood of last year's growth down to one, or at most two eyes, and then you may go still further and cut out one-half of what is left. If with judicious pruning your roses do not produce magnificent blossoms you may conclude that there is something wrong or wanting in the soil, provided the season is an average one. Perhaps it needs some fertilizer added; rich loam or decayed turf mixed with its bulk of rotted dung, is

better than clear manure and should be well worked into the soil around the roots; work it in in a circle equal to the circumference of the full spreading top.

Budded roses sometimes send out suckers or shoots from the stock; in planting such, it is well to set them with the junction of the stock and bud below the surface, so that the budded portion may form roots of its own, and thus become independent of the stock. Watch for any indication of suckering, and rub out all buds before growth is made.

Pot Culture. If out-door culture of roses is comparatively simple and easy the culture in the house, conservatory, etc., is generally attended with many difficulties. For pot culture we select the tender or monthly classes, though with care some other sorts may be grown with moderate success. I shall confine myself to dwarf and tender varieties; and these must be selected with reference to the care, etc., which can be accorded them by the cultivator. And first, as to pots—these should be clean, free from mould, and large enough to correspond with the size of plant and roots to be grown in them. Potting soil should be composed of old pasture turf, loam, and rotted cow manure, in about equal proportions, or woods earth and sharp sand may be substituted for turf or loam—say one part of sand, to three or four of woods earth, and the same of manure. Provide good drainage by placing potsherds or charcoal in the bottom, which should have a hole in it, and be raised a little from the saucer so as to allow the air to circulate; cover the drainage material with soil; then place the plant in the centre of the pot with the roots well spread; fill in among the roots with fine soil, using every care to bring the soil in contact with each root and every part thereof, firming it moderately, after which give a gentle watering. If this potting is done before it is desirable to place the plants on the stand, the pots should be plunged out-doors in a somewhat sheltered position in sawdust, tan bark, or some like substance, to prevent drying out, there to remain till desired to place in the house or conservatory. When the plants are potted they should be pruned, as a general rule shortening in about one-half. As a general thing the temperature of our living rooms is subject to too great variations and the atmosphere is also generally too dry for successful cultivation of the rose; to remedy these defects great care should be used in parlor culture to keep an equable temperature, with suitable ventilation, and then to frequently shower the

plants. In the conservatory and greenhouse the temperature can be more equably maintained and we can measurably remedy a dry atmosphere by evaporation of water, but we may fail by giving too much moisture, causing mould, etc.; good judgment and much experience are required to keep the temperature and atmosphere in just the right state, for doing which no arbitrary rule can be given.

The soil of the pots must not be allowed to become dry or be sodden from too much wet; water well and *thoroughly* when water is given; dig up and stir the soil in the pots occasionally, as far as may be without disturbing the roots. Cut back the plants freely after blossoming, or, which is better, cut back blossom and stem as soon as they have matured. The stronger and more stocky the plant, the better it is able to support itself and produce fine, healthy blossoms. Use the greatest care not to allow the plants to become drawn, but give fertilizers in liquid form freely. Study in all your culture to render it *suitable* to the plant and the object in view.

Propagation. There are various methods of propagating and multiplying roses; such as by seed, budding and grafting, and offsets or suckers. For budding and grafting, stocks of some hardy inferior kind are generally used. The mode of budding and grafting does not vary materially from the same process with other woody plants and trees, and need not here be described.

Protection to roses left out during the winter is advantageous even to those which are quite hardy, while it is essential to those less so. The Tea, Bengal, and Noisette classes may be left out during the winter by covering with sand or earth, but usually the top dies and new growth only comes from the roots. Evergreen boughs secured around the more hardy sorts are generally the only and best protection they need or can have; where the sorts need more protection, the plants may be laid flat on the ground and covered with sand or earth an inch or two deep.

Insect Enemies. Whoever grows roses, out-doors or in, and is not troubled with insects injuring foliage or blossom is a highly favored and fortunate individual; for it seems of late that each plant and product from the soil has its peculiar insect enemies, which prove a drawback on our pleasure and a hinderance of our interests, to escape from which there is no patent or royal highway, but they must be firmly met and manfully fought. Still, where proper attention is given to soil, watering, planting, etc., and a few

simple precautions and directions are heeded, little trouble or annoyance from insects need be anticipated. In house culture the aphis and red spider are the most formidable; for the first, fumigation with tobacco, when it can be done, is the best thing, but if the aphis is any ways abundant the plants will need fumigating at least twice, a day or two intervening between the fumigations, to be sure of the destruction of all, with the young. Where the use of tobacco is objectionable, four ounces of quassia chips, boiled in four quarts of water ten minutes, with four ounces of soft soap dissolved in the liquid, and applied with a soft brush to every part, leaf and branch, of the plants, after fifteen or twenty minutes syringing the plants with pure water, will answer as a substitute. Out-doors in May, or as soon as the leaves begin to grow, the rose caterpillar begins to glue the leaves together, to form a shelter for itself. Go over the plants frequently and pinch these folded leaves, thus destroying the insect; this is the most simple and efficacious remedy, if it be a little revolting to the very fastidious. For the sawfly larvæ, and other later appearing insects, syringing with a solution of four ounces of whale oil soap in four gallons of soft water will usually destroy them; where this proves inefficacious, powdered white hellebore, sprinkled over the foliage while wet, will prove effectual; but let no one think that a single application of any one remedy is all that may be needed during one season, but be prepared to repeat whenever necessary. The rosebug or rose chafer, is a pest which often destroys the blossoms, its nature depriving us of the opportunity to attack them except in the perfect state; and then we must destroy them by pinching their heads, stamping on them, and scalding; a little daily attention for five or six weeks will effectually dispose of them. Toads are fond of them and will dispose of large numbers when an opportunity is given them.

Mildew sometimes attacks the rose, and is usually caused by extremes of heat and cold, excessive and continued dampness, with continuous cloudy weather, too little bright sun and fresh pure air; sprinkling with sulphur and soot are remedies, but caution must be used not to give the sulphur too freely, or it will destroy the foliage.

To sum up, I would only add, that the whole culture is comprised in the seasonable, careful, judicious, and sensible application of the natural laws of cause and effect.

I herewith subjoin a list of such hardy and tender varieties as I

believe to be best adapted for general culture in our New England climate.

China. *Agrippina* or *Cramoisi Supérieur.* — Rich, velvety crimson; moderately double.

Ducher.—Pure white; medium size, free bloomer, good form.

Eugène Beauharnais.—Bright amaranth; fine form and fragrant.

Impératrice Eugénie.— Silvery rose; large and fragrant.

Jacksonia.—Bright red; very double.

La Superbe.—Purple crimson; very double, opening uniformly well.

Tea. *Adam.*—Rose, salmon centre; large and full.

Bon Silene.—Rosy carmine, shaded with salmon; fragrant and free blooming.

Catherine Mermet.—Bright flesh color; large, full, and of fine form.

Isabella Sprunt.—Sulphur yellow; resembles Safrano, except in the color of the flowers.

Madame Camille.—Delicate rose; large and full; of good habit, and free from mildew.

Marie Van Houtte.—White, slightly tinged with yellow; large and full.

Bourbon. *Duchesse de Thuringe.*—White, slightly tinged with lilac.

Du Petit Thouars.—Crimson; fine and hardy.

George Peabody.—Dark, velvety crimson; an American variety.

Hermosa.—Bright rose; a very constant bloomer.

Queen of the Bourbons.—Fawn and rose; very fragrant, and a profuse bloomer.

Souvenir de la Malmaison.—Delicate flesh color, tinted with fawn; large and double.

Noisette. *Aimee Vibert.*—Pure white; single, small, blooming in clusters; hardy.

Celine Forestier. Pale yellow, deeper towards the centre.

Cloth of Gold.—Deep yellow centre, with sulphur edges; rather shy, but magnificent in bloom.

Lamarque.—White, with sulphur centre; flowers in clusters; fine climber under glass.

Pumila.—Salmon, shaded with rose; free bloomer.

Solfaterre.—Sulphur yellow; large, double, fragrant.

Hybrid Perpetual. *Alfred Colomb.*—Crimson, shaded with carmine; full, globular form; large, fragrant.

Charles Lefebvre.—Reddish crimson ; velvety, rich, large, full and well formed ; fragrant.

Countess Cecile de Chabrillant.—Deep pink ; medium, full, perfect cup form ; fragrant.

John Hopper.—Bright rose with carmine centre ; large and full.

La France.—Delicate silvery rose ; large, full, globular form, constant bloomer ; very sweet.

Madame Victor Verdier.—Brilliant carmine crimson ; large, full, globular and free bloomer ; fragrant.

Miscellaneous. *Baltimore Belle.*—Pale blush, changing to near white ; compact and double.

Queen of the Prairies.—Bright rosy red, frequently with white stripe.

Blanchefleur.—White, slightly tinged with flesh ; very fragrant.

Madame Hardy.—White ; large, very fragrant and free from mildew.

Persian.—Deep bright yellow ; small but prettily shaped ; very early.

White.—Pure white ; very double, with the delicate fragrance of the violet.

Discussion.

The President being obliged to leave, the chair was taken by Rev. A. B. Muzzey, of the Committee on Publication and Discussion.

M. H. Merriam said that he had listened to the essay with much interest, but there were some things not mentioned or even suggested in it. One is the inquiry why as good success in forcing roses has not been attained south of this as here, so that New York is in large measure dependent on Boston for its forced roses. The case is similar in Philadelphia, where the winters are still milder, and also in lower latitudes. How can the outside climate affect roses grown under glass, where we have control of the climate? Another point is, whether in cutting roses to leave one or two buds for future development or to cut close, or on older wood. Certain treatment develops wood, and other treatment develops fruit. What is the cause of "blind" wood with few flowers? What is the effect of chemicals, such as oxide of iron, on the color of roses? What is the effect of an extra supply of carbonic acid gas? Some

experiments have indicated beneficial results. Is the decay of leaves on roses a disease, or is it caused by a fungus, or by too much water? The diseases of roses generally is an interesting subject; are there specific symptoms, and if there are, what are they, and what are the remedies?

N. B. White asked whether the failure to grow roses south consisted in a failure to get a good growth of wood, or whether wood was produced without flowers.

Mr. Merriam had no particular information on the subject.

James Cruickshanks was satisfied that if we had good hardy wood, the more closely we prune, the better roses we get. He had covered a bed of Moss roses with moss from the woods, pruned to two or three buds, and pegged down the shoots, and the bed made a complete flame of flowers.

The discussion, owing to the engagement on committees of several gentlemen who would otherwise have taken part, was not as extended as usual. The Chairman announced that on the next Saturday Professor W. O. Atwater would speak on Fertilizers.

MEETING FOR DISCUSSION.

SATURDAY, February 9, 1878.

A meeting for discussion was holden at 11 o'clock. William C. Strong, Chairman of the Committee on Publication and Discussion, presided, and introduced Professor W. O. Atwater, of Wesleyan University, Middletown, Conn., to lecture on Fertilizers.

Professor Atwater said that he proposed to give, not a formal lecture, but rather a "talk," on the general subject of plant food, as supplied by soils and fertilizers, and should first state some important principles. The character of the soil as to moisture, texture, warmth, etc., is very important, but its supply of plant food is even more so for the growth of crops. Every plant in order to grow must have food. This is not a newly discovered principle, but, until quite recently, no one has known just what ingredients are necessary to the growth of plants. Prof. Atwater here described some experiments made by Nobbe, to test the importance of the

various ingredients of plant food, the description being illustrated by a diagram, representing several buckwheat plants growing in different solutions of plant food, — one with all the ingredients needed; one with all but potash; one with nitrogen omitted; one without phosphoric acid, and so on. It was found that if any one essential ingredient was not supplied in sufficient quantity, the plant would not grow. A solution containing all the necessary ingredients, is known as a normal solution. In such solutions plants are raised as large, as healthy, and in every way as perfect as those grown in the soil. Wolff raised in such a solution four perfect oat plants with forty-six stems, and 1,535 well developed seeds. Nobbe obtained a Japanese buckwheat plant, nine feet high, weighing, air-dry, 4,786-fold the weight of the seed, and bearing 796 ripe, and 108 imperfect seeds. And Professor Knop used to delight in showing his friends a young oak tree, very small indeed, but the growth of which had been normal, though its roots had been immersed only in aqueous solutions. The results of a vast amount of this sort of experimenting all point in one direction, and prove this principle.

No agricultural plant can attain full growth without a sufficient supply, through its roots, from the soil, of *potash*, *lime*, *magnesia*, *iron*, *phosphoric acid*, *sulphuric acid*, and some compound of *nitrogen*.

Besides these, chlorine, and perhaps silica, are sometimes, if not always, indispensable, though in very small proportions, to complete development. If any one of these *essential ingredients* be lacking, the plant will suffer in growth and development.

Such experiments as these, coupled with practical experience in the field, have led to almost a revolution in our views of fertilizing. We have learned that we must put on manure to feed plants. But there are various important conditions of the successful working of manure, among which are proper tillage and thorough mixing of the fertilizers with the soil. The indirect action of fertilizers is a very important point.

Every soil, however barren, is capable of furnishing some plant food. In what are called "worn-out soils," the available supply of one or more ingredients is generally insufficient.

In experiments with buckwheat plants grown in boxes of sand taken from the well-known barren plains in Wallingford, Conn. (on the line of the N. Y., N. H., & H. R. R.), the plants grown with-

out phosphate were nearly as tall as those with a complete fertilizer, but were slender and the seeds were deficient in weight; without potash the same as without phosphate; while without nitrogen, the growth was almost nothing, showing that this soil lacked available phosphoric acid and potash, and, most of all, nitrogen. Some soils will grow almost anything that is planted on them; such soils possess all the ingredients of plant food.

Prof. Atwater said that he had received hundreds of letters, of which the burden was, What shall I put on my soils to produce crops? If all soils were alike in their ways of supplying crops with food, and all crops alike in their ways of using it, the answers to such questions would be easy; as it is, it is impossible to lay down rules to cover all cases.

The chief value of fertilizers is their plant food. The main use of guanos, phosphates, bone, fish, potash, salts, and the like, is to supply the crops with food which they cannot get enough of from the soil. The rule in buying them should be to select those which supply in the best forms and at the lowest cost, the plant food which the crops need and the soils fail to furnish.

We may take it as pretty well settled that the only ingredients of plant food which we need supply to our soils, are *potash*, *lime*, *magnesia*, *phosphoric acid*, *sulphuric acid*, and *nitrogen*. Iron and chlorine are necessary to the perfect growth of plants, but only in minute quantities. Silica and soda are needed, if at all, in similarly small proportions. Every ordinary soil supplies these last four substances in abundance.

Of the above list, the magnesia is rarely deficient in even "worn-out" soils. Sulphuric acid and lime are more often lacking, and hence, doubtless, one reason of the good effect so often observed from the application of lime and plaster. The remaining substances, *phosphoric acid*, *nitrogen*, and *potash*, are the most apt to be deficient. In some soils one, in others several or all, of these may be wanting. When we say the ingredients are "wanting," we do not mean that the soil does not contain them, but that it does not supply the crops as much as they need. It is not so much because our "worn-out" soils have not enough plant food in store that crops starve upon them, but rather because the food is locked up in such combinations that the roots can not get at and use them. Such is the general result of the best testimony that experience and experiment have placed at our disposal.

It was once thought that the chemical analysis of a soil would easily reveal its deficiencies in plant food. But later experience has shown this to be, at best, a costly and very defective source of information. Different samples of soil, taken from different places in the same field and at different times, may vary widely in composition, and, what is a still greater difficulty, the chemical tests which prove the presence of a given ingredient in the soil, do not tell whether it is already in such a form that the plant can use it, nor whether or how soon it may become so. And there are many other factors of vital importance to the development of the plant which soil analysis does not reveal.

To find what materials crops remove from the soil is an easier matter. Thousands of analyses of the more important vegetable products have been made, nearly all in Europe, however, and we have tables prepared from them giving the average composition of our field crops. From these any farmer may calculate how much plant food a given crop takes, on the average, from his soil. The figures might possibly fit his case no closer than would the calculation of his own weight from that of the average European, but they will suffice well enough for practical purposes.

Formulas for fertilizers for special crops are frequently based upon calculations of this sort. For instance, a crop of fifty bushels of corn, with the stalks, would take from the soil, on the average,

Nitrogen,	76 lbs.	Magnesia,	23 lbs.
Phosphoric Acid,	51 "	Lime,	27 "
Potash,	72 "	Sulphuric Acid,	8 "

Now we may assume that nitrogen, phosphoric acid, and potash, are the only substances the soil will fail to furnish in plenty, or that, if lime and sulphuric acid are needed in addition, there will be enough in the superphosphates and other materials to be used, to supply them. We have then to provide 76 lbs. of nitrogen, 51 lbs. of phosphoric acid, and 72 lbs. of potash, in forms readily available for plant food.

We could supply the nitrogen in, say, 760 lbs. of dried blood, at a cost of about $15.40, the phosphoric acid in 340 lbs. of dissolved bone black, costing $6.00, and the potash in 144 lbs. of muriate of potash, costing, say, $3.20. This would make for our 50 bushel corn crop, 1,244 pounds of fertilizing material, at a cost of $24.60. It would be a costly application, even if it were sure to improve the yield by fifty bushels.

But need so much of all these ingredients be used? The crop may have the power of making use of the compounds of nitrogen already stored in the soil or supplied by the atmosphere, so that at least a part of the $15.40 worth of nitrogen will be superfluous. The application of gypsum is often equivalent to the addition of potash, since gypsum tends to liberate this from its combinations in the soil, and thus render it available to plants, and so we may get our potash at a good deal less cost than in the $3.20 worth of potash salts. Or, for that matter, the soil will very likely supply plenty of potash and we may leave it out of account entirely in our formula. The physical condition of the soil affects very materially the feeding of plants and the action of fertilizers. For these, and various other reasons which this is not the place to discuss, and which are, in the present state of our knowledge, very imperfectly understood, the formula, however attractive in theory, might be far from the most economical, in fact.

One of the chief defects of formulas on this plan is that they take no account of what we may call the feeding capacities of the crops. A vast deal of experience in the laboratory and in the field bears concurrent testimony to the fact, though we know as yet very little about how or why it is so, that different kinds of plants have different capacities for making use of the stores of food that every soil contains. Clover will get plenty of nitrogen where wheat will fail for lack of it. Nitrogenous manures help clover but little, and are almost a specific for wheat; and this, notwithstanding clover contains a great deal, and wheat but little nitrogen. Lawes and Gilbert found that a soil from which a clover crop had just been removed, contained more nitrogen than it did before the clover was put in; that, in other words, the soil, to the depth of nine inches at least, was positively enriched by the growth and removal of a highly nitrogenous (clover) crop. The nitrogen for a clover crop of two tons on this plan would cost perhaps $16. To buy and use it — at least so much of it — would be absolutely wasteful.

The analysis of a plant is a very incorrect standard for the fertilizer to apply to it. The idea of fertilizing on this basis is old, simple, attractive, costly, partly rational, and often profitable. It is a step in advance of the common plan of using fertilizers at random. But it is uneconomical in the extreme.

The next step in advance would be to fit the fertilizer to the actual demands of the crops. This may be done by classifying

crops according to their predominating requirements, and adapting formulas to the several classes. For general and indiscriminate use, where the character of the soil and other special conditions cannot be taken into account, this plan is open to less objections than any other.

But, even if our knowledge of the laws of plant nutrition were sufficient for accurate calculations, as it is not, this plan would still leave several very important factors out of account. The weightiest is the supply which the soil can itself furnish. The next step in advance, then, must be to test the soils.

The farmers near Middletown (where Professor Atwater resides), need potash; in other places, potash does little or no good. How shall each of us ascertain what our soils most need? There is no better way than to try experiments on a small scale before making large investments; to put the question to the soil with different fertilizers and get the answer in the crops.

The best agricultural chemists in this country and in Europe, are agreed in this opinion. Stoeckhardt, Knop, Wolff, Ville, and Voelcker, have all recommended farmers to try experiments to test the action of different fertilizing materials upon their soils. Of course, there are soils so uneven that experiments on a small scale cannot be decisive. Nor will a single crop tell the whole story. To get the best results, the experiments should be carried through a series of years, — through a course of rotation, for instance. The soil should be without previous accumulations of fertilizing matters to interfere with the action of the fertilizers. By proper care, trials may be made which will bring valuable results at comparatively little cost.

Acting on these principles, the Connecticut Experiment Station, of which Prof. Atwater was Director, in the spring of 1877, sent out to as many farmers, nearly fifty sets of fertilizers, with directions for experiment. It was recommended that these experiments should be tried on long parallel strips of ground, as likely to give greater average uniformity of soil than the same area in a square. Nearly twenty of these farmers have reported, and their reports are in accordance with what has been said. There is a great difference in soils, and what produces the desired effect in one case, may not in another.

Prof. Atwater described an experiment made by D. H. Birdsey, of Middlefield, Conn., on six plots, the first of which was manured

with dried blood, furnishing nitrogen; the second with superphosphate; the third with a potash salt; the fourth with a mixture of the first two; and the fifth with a mixture of all three. Each of these plots contained ten square rods and received twenty pounds of fertilizer. The sixth, which was of the same size, was manured with barnyard manure at the rate of five cords to the acre, hen dung and ashes being added in the hill. The plots were all planted with corn. On the third plot, with potash salt; the fifth with dried blood, superphosphate, and potash salt; and the sixth with yard and hen manure and ashes (which also furnished potash), the crop looked well through the season, the stalks were large and strong, the ears well filled, and the grain good. On the plots without potash the growth was very poor, the stalks small, weak, and yellow, and the ears poorly filled. This experiment was not in all respects perfectly accurate, and its results are not to be taken as mathematically exact; but the fact that on the three plots where there was no potash the crops uniformly failed, and that on the plots where potash was applied they were uniformly good, shows that the weak point of this soil was potash, and that the strong point in any fertilizer applied to it should be potash. The fifth plot, with potash only, producing as good a crop as the fifth or sixth, which had potash and other ingredients, is a strong indication that the soil already contained enough of all materials except potash. But in the next field the case may be different. The potash salt on the third plot would cost at the rate of $6.72 per acre, while the yard manure on the sixth plot cost $40 per acre, besides the ashes and hen manure.

In a very careful experiment on sixteen plots, with as many different fertilizers, by W. I. Bartholomew, of Pomfret, Conn., in every case where phosphoric acid was omitted the crop failed, and in every case where it was applied in any form, either by itself or in combination with other substances, the crop succeeded, and the quantity of corn was remarkably in the proportion of the phosphoric acid applied. What this soil most needed was clearly phosphoric acid.

An experiment by Chester Sage, of Middletown, Connecticut, resulted in failure, in every case, except where a complete fertilizer was used. Dried blood, superphosphate, potash salts, and plaster alone, each brought crops no larger, and, if anything, poorer in quality, than where no fertilizer was applied. The mixture of

dried blood and superphosphate, corresponding to a first-class "ammoniated" superphosphate, did scarcely any better. In each case the crop was, as Mr. Sage says, "all refuse corn and hardly worth saving." But with the complete fertilizers, the yields were good. Hen manure, which furnished all the ingredients of plant food, brought about forty bushels of shelled corn per acre. The mixture of dried blood, superphosphate, and potash salt, which cost at the rate of $16 per acre, and furnished nitrogen, phosphoric acid, and potash, but doubtless in larger quantities than the hen manure, brought sixty bushels of very fine corn to the acre. "This," Mr. Sage says, "was such a crop as I like to have. It grew well all summer, and the corn was very fine. The stalks were large and green when the corn was ripe, and will make excellent fodder." This soil showed the need of a complete fertilizer.

A similar series of experiments was made on the farm of the Maine Agricultural College by a student, Mr. Lufkin, under the direction of the Professor of Agriculture, Mr. Farrington. In these experiments potash did little apparent good. Potash salts alone, improved the yield very slightly, or not at all, and fell far short of paying their costs. Mixed with dried blood and superphosphate, the case was a trifle better. On other portions of this field, Prof. Farrington had no success with kainit, and found leached ashes to help grass as much as unleached. Among the crops most apt to be helped by potash are grass, potatoes, roots, and the leguminous crops, which include beans. None of these got any apparent benefit from the potash here. On the whole, potash does not seem to be needed on this land.

The only case where dried blood alone seemed of any use was with potatoes; but with phosphoric acid it evidently increased the crop in several cases.

Phosphoric acid was uniformly and largely beneficial. The superphosphate alone, gave the largest potato crop of all. It also served an excellent purpose with nitrogen there, and the two together brought the best yield of turnips on the field.

Taking all in all, as tested by the crops and fertilizers named, the chief need of this soil seems to be phosphoric acid; the next nitrogen. In its present condition it does not seem to call for potash.

As indicated by the experiments, this is a soil on which artificial fertilizers of the right kinds, and with the right crops, can be used

with great profit. Some soils give but little return for manures applied; others respond bountifully to even small applications. Such, the Germans very aptly term "thankful" soils. This is one. Left to itself it seems to be able to do very little, but with a very little help it brings good crops. On the supposition that the single plots without manure were fair samples of the whole, notwithstanding the large quantities used and the high prices allowed, the nitrogenous superphosphates gave, with potatoes and turnips, a gain of from $50 to $80 per acre. But while the fertilizers brought such profitable returns of potatoes and roots, with beans there was almost uniformly a loss. This accords well with what Mr. Lawes, of England, says as the result of thirty years' experimenting and practice with fertilizers, that "it is not advisable to sow artificial manure with beans, peas, tares, or other leguminous plants. Corn, *i. e.*, grain, and root crops, will take all the artificial manure which the farmer can afford to pay for."

Prof. Atwater said that he did not feel justified in making many generalizations from these experiments, though future experience might warrant more. One or two points were, however, worthy of mention. The cases in which nitrogen, in the form of dried blood, by itself, appeared, in the reports, to be especially beneficial to corn, were very few—not more than one in ten. He did not think this could all be due to the wrong application or excessive quantity of the dried blood used. Doubtless, if the nitrogen had been in the form of sulphate of ammonia, or nitrate of soda, or Peruvian guano, the results would have been very different. Still, it looked as though the corn crop did not require the application of very large quantities of nitrogen in fertilizers.

Superphosphates proved beneficial in nearly every case where the trial was a fair one. At the same time there are numerous well-attested cases of worn-out soils in which phosphoric acid was evidently not needed.

As regards potash, out of twelve cases in which farmers in the vicinity of Middletown had reported their experience last season in these experiments and in their field practice, potash salts were apparently profitable in ten, and without benefit in two. Elsewhere, the reports average less favorably for potash salts.

These experiments illustrate how crops vary as to their feeding capacity; how soils also may vary, and that these two factors must be taken into account. The whole matter may be summed up into

the advice: First, use all the manure that is produced on the farm; then, since most farmers in the older states need something more, experiment to ascertain what fertilizers produce the best effect. Whoever will use fertilizers economically and profitably, must select the ones that supply the materials which his particular crops need, and his soil fails to furnish. And the question what is most needed in a given case, can be tested in no better way, — indeed, in no other way than by direct experiment, — by putting the question to the soil with the fertilizers, and getting the answer with the crops. Of course, the effects of weather, tillage, physical character of the soil, indirect action of the fertilizers, and so on, count for a great deal, and the most reliable results will come only after repeating the experiments for a series of years, through a course of rotation of crops, for instance.

Leander Wetherell asked how Mr. Birdsey's soil was treated before the experiment.

Prof. Atwater replied that in that region the farmers had long been in the habit of using a good deal of bone, superphosphates, guano, and fish. These supply phosphoric acid and nitrogen, but little or no potash. Mr. Birdsey says that on this particular soil, bone used to produce an excellent effect, but of late he sees scarcely any benefit from it. It would seem as though this land had become relatively over-charged with phosphoric acid and deficient in potash.

Benjamin P. Ware spoke of farmers in Danvers who raised large crops of potatoes of superior quality, year after year on the same land, with Peruvian guano, so that the principle has been established that guano does well there. Probably this would not apply to all soils.

Prof. Atwater saw no reason why this should not be so on farms in Danvers, nor any reason why on others the case should not be different. Phosphoric acid and nitrogen are the ingredients most often lacking in our soils, and are supplied abundantly and economically in Peruvian guano. Prof. Atwater spoke with approval of the process of "rectifying" Peruvian guano, which, as imported, contains large lumps and some stones, and not much sulphuric acid. In rectifying, the stones are removed, the lumps pulverized, and the whole mixed to make it uniform. Sulphuric acid is added, as to bone and mineral phosphate, to make the phosphoric acid more readily soluble and to fix the ammonia.

The rectified guano is sold in immense quantities in Europe, where its use has increased uniformly since its first introduction.

Prof. Atwater added that the indirect action of fertilizers counts for a great deal. Fertilizers often help plants to get food from the soil which otherwise would be inaccessible to them. This helps to explain the action of plaster.

Fertilizers give rise to chemical changes which liberate other plant food in the soil; as to how they effect this, we are much in the dark. We should not however despair of ascertaining. Twenty years ago no one could say whether potash was necessary for the food of plants, but now we know it is. The increase in our knowledge of the laws of plant growth, and of what has to do with successful crop growing and stock raising, has, during a comparatively few years past, been simply immense. Take away from our agriculture what has been added to it during the last fifty years by that accurate and rational observation and experimenting which constitutes true science, and it would be very little in advance of that of the Romans.

Dr. Peter Pineo thought that a rational and satisfactory explanation of the effect of gypsum or sulphate of lime, which produces remarkable results on some soils, while in others its action is negative, might be found in the well-known principles of chemical affinity, where two substances of different chemical combination came into contact — as in solution — forming new compounds, and liberating gases. For instance, carbonate or phosphate of soda or potash, coming in contact with tartaric acid, or sulphuric acid, in solution, will have set free carbonic acid, or the phosphates, and tartrate or sulphate of soda or potash will be formed. It is well known that wood ashes coming in contact with hen manure will set free the ammonia.

We have a well marked case of double elective affinity, in the familiar experiment of sulphate of zinc and acetate of lead, which, when brought together in solution, produce two new compounds. The sulphuric acid leaves the zinc and combines with the lead, for which it has a stronger affinity, forming sulphate of lead, while the acetic acid combines with the zinc, forming acetate of zinc. These processes which we see in the chemical laboratory are clearly explanatory of those wonderful effects obtained in the vast laboratory of Nature.

The gypsum, or sulphate of lime, applied to some soils, will

find elements with which to make new combinations, setting free in a condition available for plant food the nitrogen, the phosphates, or potash—the three great staple fertilizers—which, according to Prof. Atwater, if present in, or applied in sufficient quantity and available form to any soil, will be quite sure to find an abundance of the other and less important elements, to insure a good crop.

Prof. Atwater, in answer to an inquiry, said that he had made no experiment in the application of sulphuric acid directly to the soil.

Mr. Wetherell had read an account of its application in a very weak solution, with the effect of increasing the crop. It was inferred that it set free plant food.

John B. Moore being asked to express his views of the subject under discussion, said that he was exceedingly pleased with Prof. Atwater's address, and that he agreed so fully with it that he had nothing to add.

Mr. Wetherell thought that what Mr. Moore had said was the highest compliment that could be paid to Prof. Atwater's lecture.

O. B. Hadwen said that Prof. Atwater had shown the values of different fertilizers as applied to different soils, but still he told us that the seasons and other circumstances affect their operation. It was a surprise to him that these fertilizers are as regular in their effect as they are. They will be especially valuable to all who have lands difficult of access.

The Chairman remarked that fruit growers apply the same fertilizers to different trees and wonder that their apples do not do as well as their pears.

Mr. Wetherell had tried a set of the fertilizers mentioned here, and common land plaster produced a better effect than any one ingredient or any combination, or than the Stockbridge fertilizers. This puzzled him, but Prof. Goessman said it showed that the cheapest of the ingredients was the best for that land. What we want is to save the expense of carting heavy barnyard manure, which, Lawes says, contains only sixty-two pounds of plant food in a ton.

Prof. Atwater said that it puzzled him to know why things should behave in a certain way in one soil, and in an entirely different manner in another. He did not mean to say that the three substances which he had spoken of as most generally deficient, were the only ones that should be applied to our soils. He thought the

good effect of plaster was its indirect action, which is a convenient term for covering our ignorance. Plaster serves directly as plant food. Water passing through soil mixed with plaster, brings out more potash. Plaster fixes ammonia, and by preventing evaporation, is beneficial in drought. Even with our imperfect knowledge there are many ways in which we can conceive of the beneficial action of plaster.

Mr. Hadwen said that it is impossible for the farmer to extract the sixty-two pounds of plant food from a ton of manure. It is easier to haul the whole of it on to the land.

Prof. Atwater said, supposing it contains but sixty-two pounds of plant food, this is not all its value. To get the largest possible crop on his land, Mr. Lawes, in England, would use chemicals. But in England, where there is less drought than here, and on a naturally strong soil, these might answer as well as the manure. Here, however, the evaporation is immense; the rains settle down into the subsoil, and in dry weather come up again. If we could prevent them from escaping we should have no drought. Manure in the soil may retard this evaporation. The other 1,938 pounds in the ton undergo chemical changes in the soil, improve its texture, and turn into active forms the inert plant food the soil contains.

Mr. Hadwen asked whether manure would become plant food sooner when on the surface or when ploughed in.

Prof. Atwater replied that manure acts in a great many different ways, and might sometimes become plant food sooner when applied to the surface, and sometimes when ploughed in. Well-cured manure, applied when in the proper condition, always works well. But when the fermentation goes too far, not only is much valuable material lost but what remains becomes changed more or less to inert forms. If the manure is to be fermented, the process should not be too rapid nor carried too far. Now if the manure is spread on the ground when it is fresh or partly cured, it will not ferment much; it will lose extremely little valuable material, and rains and melting snows will soak the material into the soil as fast as it is rendered available, and thus it will be saved. If allowed to stand in small heaps it is apt to ferment so much as to waste a good deal. You must have it where the roots feed, and this is mostly in the first six inches of the soil. If you can apply it a considerable time in advance, spread it on the surface; there will then be less loss than when put in even small heaps; but the rain and the snow will

wash the manure into the soil. Some loss would occur when spread on the soil if the ground was frozen.

Mr. Ware, referring to what Prof. Atwater had said of the tendency of manure to operate on the soil, asked if there was not something gained by mixing fermenting material with plant food which does not ferment, as, for instance, stable manure or glue refuse with meadow muck.

Prof. Atwater said that he should answer to Mr. Ware's question, most emphatically, yes. With all our science we find our scientific knowledge most valuable when it leads us back to the simple processes which nature produces. Nature provides processes of fermentation and decay by which highly organized animal and vegetable matters are decomposed and brought into simple forms, in which they can be used by the plant. Some samples of meadow muck are richer in plant food than any manure except the very best. These produce no effect in their natural condition, but by drying, decay, and fermentation, the bad qualities are removed and the good brought out. There is a great deal of difference in the quality of different deposits of muck and peat. In composting we should use materials which will aid the work of decomposition, and at the same time supply plant food, such as lime, plaster, or potash in its cheapest form. These will change useless, or worse than useless, materials into valuable forms. It is better to mix several materials; a mixture does more good than a single ingredient.

Mr. Moore said that many years ago he made himself believe in compost, but his crops said it was a fraud. Some peat is so full of sulphate of iron as to be injurious to plants. Farmers make a compost heap on the land, but how can you compost manure better than by ploughing it in?

Prof. Atwater assented to the last point made by Mr. Moore, as regards manure, but asked, Suppose you have a good muck bed in the back pasture, but cold and wet; will it not be profitable to dig it out, dry it, cart it to the barn, and compost it? The quantity of plant food in muck is very variable; he had looked at one bed and advised not to use it, but beds composed of decayed leaves and branches are very valuable, sometimes containing more nitrogen than barnyard manure.

Mr. Wetherell said that we wanted to use soil or muck as an absorbent, but he knew of a farmer who had got tired of carting the soil of his fields to his barnyard and then carting it back again.

Prof. Atwater said that many samples of fertilizers came to him for examination, and that many farmers pay too much for them, because they fail to discriminate not merely between good and bad, but between those which are most appropriate to their soils, and those which are not.

Prof. Atwater's lecture was illustrated by specimens of fertilizers, and by diagrams of Dr. Nobbes' experiments with plants in solutions, and of experiments made by the lecturer in barren sand, and by tabular views of the experiments made under the direction of the Connecticut Experiment Station. It was listened to with great interest throughout, and at the close Mr. Moore moved a vote of thanks to Prof. Atwater for his able and instructive address, which was unanimously passed.

MEETING FOR DISCUSSION.

SATURDAY, February 16, 1878.

A meeting for discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The discussion was a continuation of that of last week on Fertilizers.

Dr. E. Lewis Sturtevant opened the discussion. He had had no time to prepare a paper, but said that he had carefully considered the subject, and that the facts he should present would be correct, and the opinions given such as he had deliberately formed.

He referred first to the history of fertilizers, and claimed that a substance had been extensively used during ages, and had, on the average, always produced crop-results. This substance was dung. In 1840, Liebig first brought the subject of artificial fertilizers vividly before the public, in his masterly writings, and his views had received such currency that their few errors had become difficult to eradicate from the public comprehension. He, however, proved one true and important fact: that the elements of the plant were taken as such from the soil, and that plants could receive into their structure mineral food artificially supplied. Hon

J. B. Lawes, of England, in his series of experiments covering thirty-four years with the same crop under similar conditions, has shown that artificial fertilizers or chemicals are the equivalents of dung, and Ville, of France, has, in like manner, confirmed and added to this conclusion. In addition to their scientific value, Mr. Lawes' experiments have shown the reliability of a mixture of fertilizers in producing crops, and he has stated, as the result of his long experience, that under certain circumstances he should give the preference to a chemical over an animal fertilizer like yard manure.

Dr. Sturtevant said we may claim, also, from experimental evidence, largely negative in its character, that a complete fertilizer is the equivalent in crop-producing capacity to dung, while the theory of Ville, that the farmer can cause the plant to analyze the soil, and determine the needs of the soil, has received no confirmation in practice. Dr. Sturtevant therefore claimed with considerable positiveness, that the plan of applying single fertilizers to limited areas for a single year, is unworthy the attention of the practical farmer, as having never been productive of information in regard to the cropping condition of the land in the past, and as not promising anything at present. An application of a single fertilizer may, however, in the hands of a trained observer, offer valuable information, but it is incapable of analyzing a field and showing its deficiencies, until in some way—an impossible thing at present—we are assured that the field is of a uniform composition, a uniform physical state, and the crops planted are all treated in a uniform manner during growth, originating from seed of uniform heredity, and special hereditary characteristics.

He said that the great difference between the single and the complete fertilizer was in their relation to each farmer's practice. That the single fertilizer might advantageously supplement dung, while the complete fertilizer can replace dung. That the farmer who uses a complete fertilizer secures the same certainty as if using dung, while the farmer who uses a single fertilizer secures favorable or unfavorable results according to the condition of the land in reference to past supply of plant food. If we know our land is deficient in one element, then we should apply this element. But we cannot know this, as there are continual changes occurring in the land, and it is but the available plant food which concerns us as farmers, and not that in an inert state, so far as regards this question.

Benjamin P. Ware understood that Dr. Sturtevant had expressed the opinion that it would be profitable to sell barnyard manure and purchase chemical fertilizers, and asked whether he was still of that opinion.

Dr. Sturtevant replied that it was but a question of price. When the price of dung is relatively higher than that of fertilizer, then he was ready to sell. At the present time he would sell dung at eight dollars a cord, for this was more than its chemical value, and he could secure larger returns in crops from the eight dollars invested in fertilizer than from the cord of dung.

At the present time, Stockbridge's idea is undergoing trial, and the experience of several years has been confirmatory of its real value. The speaker could say, and would say, that the Stockbridge formula offered a substitute for dung which enabled him to cultivate all the land he pleased, and which, at present prices of fertilizer and product, left a handsome margin of profit. The Stockbridge formula was certainly a more philosophical method of obtaining results than the Ville formula, as being based on the wants of the plant, in preference to being based on the accidental product, dung.

In the national characteristics of the Germans, we recognize a thoroughness of agricultural thought which is commendable, but in agriculture the Germans show little power of generalization. In England, the farmers have been taught empirically, through experience, the value of artificial fertilizers, and, as a consequence, there is more of fertilizing material imported into that country than into any other portion of the world of the same area. The American farmer — the intelligent one — is more of a scientific farmer than the English farmer, and endeavors to use the results of investigation as generalized to meet his case; and hence new ideas of fertilization find an extended welcome, and receive more careful and unprejudiced trial than elsewhere.

In response to a question, Dr. Sturtevant stated that Messrs. Prout and Middlemarch, of England, had farmed extensively, using fertilizers as directed by Dr. Voelcker, and the results were unquestionably successful.

He added that fertilizer experiments are often vitiated by the failure to consider the importance of seed, and, as an illustration, that if we have two seed corns, one of the normal productiveness of thirty bushels per acre, and another of sixty bushels, and plant

this seed on land of a fair agricultural condition, the fertilizer will not cause the thirty bushel variety to as readily respond as it will the sixty bushel variety. In other words, it is as easy to grow the sixty bushels in one case as the thirty bushels in the other; and hence, unless this difference of productive capacity be considered, we cannot fairly measure the apparent effect of the plant food applied to the soil. In land of sufficient fertility to mature a thirty bushel crop with either seed, an application sufficient to cause the better variety to yield sixty bushels, will probably not cause the thirty bushel variety to harvest over forty bushels. He repeated, however, that in order to test these differences even, the trial must be on a sufficiently large scale, and, preferably, continued over a series of years.

The speaker considered Southern New Hampshire and Vermont, with Massachusetts and Connecticut, the most profitable farming region in America. With fair land and most excellent markets, this locality offered rewards for the application of intelligent thought to the farmer. As soon as the New England farmer learns that the amount of his cultivated land is not limited by his dung-heap, but by his capital, then shall we find agriculture the most desirable of occupations. New England cultivates too little land to a farm, for profit. The complete fertilizer allows us to extend our operations within the lines of profit to the full capacity of the farm. The duty of the farmer is to have faith in the teachings of science, and then to consider whether the teaching meets his case, and whether he can afford to practise it. Fertilizers will benefit any crop and any of our land. The farmer is to consider the cost to him of this benefit, and whether he can afford to pay for it.

H. Weld Fuller had been brought up to believe that barnyard manures have a duration vastly longer than that of chemicals; the German chemists say its effects are felt for eighteen years. The last speaker would use, on all soils, however various, one single specific. No matter how *over*much of any ingredient may be in the soil, it must still have as much more of the same added as the intended crop will contain.

Now, why should a man apply phosphates to his land when there is already in the soil more than enough for a hundred years to come? An excess of any salt when added to a soil may do mischief. This will often be shown by a deposit of a fine powder on the leaves of plants, this being an excess which the plant cannot assimilate.

Are the experiments of the Germans of no value? When the same product has been raised on a piece of land for a hundred years, and a constant supply of the needed ingredients is produced by nature, would you add what the soil already holds in excess? Stockbridge assumes that all soils are alike, and that all are barren, and supplies all he expects to reap. This seemed to the speaker to be a waste of money and material, and to be radically wrong. England has more moisture than we, and experiments there may differ from our own. But he regarded anything which tends to induce our farmers to lessen their stock or to undervalue barnyard manure, as a mistake.

Dr. Sturtevant said that he was willing to put himself on record as to the scientific question of the complete fertilizer being a substitute for dung, but that this was not the whole question by any means for the farmer to consider. There was something in the application of a scientific truth. Each country has a different climate, and the fields receive different treatment. Would we advocate the German average crop of wheat, of twelve bushels per acre, or the English average crop of twenty-five? We surely should not claim the one as the exponent of German science and the other as the exponent of English empirical practice. Yet the farmer who applies the teachings of science in the manner recommended by an honest experience, obtains yields far in excess of the mere imitator. The farmer must consider the *why* of a process, and then, if satisfied that the *why* is correctly apprehended, put his learning to a practical application.

In considering chemical fertilizers, the speaker first noted that his own experience, and that obtained from books, offered no evidence against the certainty and reliability of action of chemicals when properly applied. The presence of certain elements of plant food in excess, influences the physiological condition of the plant, and hence affects the crop. We must then see to it that this influence is in the direction of profit to us. Plants in a dung heap or a barren soil may be equally barren of fruit; superphosphate strewn on the side of a hill of corn, will cause the plant to develop more fibrous roots on that side, and hence make the plant thus situated a grosser feeder, and more capable of securing the plant food already in the soil; on old land, formerly dunged but now run out, an unneeded plant food, like salt, will oftentimes release fertility from the soil, or put the plant into a condition to secure supplies

which it otherwise could not do, and hence may act as a fertilizer, but indirectly. These diverse conditions of land, of season, and of crop, all complicate the subject, and offer sources for error in interpretation, so that, notwithstanding the differences of opinion among farmers as to the usefulness of applications, we are satisfied from the few cases where simple causes have been eliminated from the mass of possibilities and stated, that chemicals do offer a substitute for dung to fertilize our fields, and that it is the fault of the farmer alone if he use them unprofitably.

Leander Wetherell asked Dr. Sturtevant for a detailed account of his experiments. Could he bring a case where stable manure has been used continuously for a long series of years without improving the soil? Or could he give a case where chemicals have been thus used, where the fertility of the soil has been kept up and improved? He thought the doctor manifestly undervalued the reported results of the German Experiment Stations. Prof. Johnson, the Director of the Connecticut Experiment Station at New Haven, Mr. Wetherell said, incorporated into his valuable book, "How Crops Grow," the tables of Prof. Wolff, of the Royal Academy of Agriculture, at Hohenheim, Wurtemberg. The speaker doubted whether Lawes and Gilbert's experiments, if repeated here, would produce the same results as reported on their farm at Rothamstead. He was slow to believe that three specifics, nitrogen, phosphoric acid, and potash, for example, make a universally complete manure in all places and for all time. Some soils are hungry for phosphoric acid, and have an abundance of potash; why use potash where it is not needed? The same may be true of nitrogen. Let farmers and gardeners interrogate their soil with reference to these chemicals and use what is needed, and not subject themselves to the expense of purchasing what the soil already contains an abundance of in a soluble condition. He believed in experimenting.

Dr. Sturtevant said that his remarks had been rightly understood. The German experiments are the most valuable we have, and are thoroughly trustworthy, but he took the liberty of not deferring to authority when he knew better himself. He did not think the experiments described last week would bear out the interpretation given them.

Mr. Fuller asked, if the straw and vegetable matter from the barnyard were of no account, how we could enrich soils by turning in green crops, as sometimes practised.

Dr. Sturtevant replied that we put back more than we have taken from the soil. The only plant food is the inorganic elements and the nitrogen, and these are conserved from the soil by a green crop, and we can consider green manuring somewhat in the light of a fallow.

Mr. Fuller said we do not admit that a grown plant has less nutritious matter than a growing plant.

Dr. Sturtevant said that straw contains a certain proportion of ash element and nitrogen.

Mr. Fuller asked if there is not more ash in a grown plant than in an immature one.

Dr. Sturtevant replied, yes and no. Much of the ash element is not essential. Straw takes up much silica; it can be taken up in excess. Organic matter is not plant food.

N. B. White, had known many failures of crops in time of drought from using dung. It was so in Minnesota last year. He thought that the place for chemicals; he had seen many instances in the west where stable manure dried up, instead of decomposing, and the crop was poorer than if no dung had been applied.

James Cruickshanks said that he had made eighty bushels of corn to the acre with barnyard manure.

Dr. Sturtevant said that he could refer to a crop of one hundred and twenty-three bushels raised with chemicals. He did not wish to underrate barnyard manure, but simply said that the chemicals in it can be supplied as well in fertilizers. He did not wish to draw a comparison between barnyard manure and fertilizers. The province of fertilizers, if a single element, like superphosphate or potassa, is to supplement or add to the dung. The complete fertilizer is to be used when we are out of dung, and wish to till additional land. In some cases the organic matter in dung will give it an advantage, but this opens up other considerations than those which we are discussing.

Marshall P. Wilder said that all would agree that manure does contain the ingredients which have been spoken of as essential to the food of plants, and he thought that Dr. Sturtevant had placed the matter very fairly. The practical question is, What kind of manure shall we use? He had always held to making a perfect and thorough trial, for we have not practical knowledge enough. Mr. Wilder related an instance where he directed a man to apply a fertilizer to a plot of celery, and he put a whole bag on one row

and killed it. That was an experiment that taught something — it showed that a less quantity was sufficient. It is a simple matter to lay out a piece of land in strips, and apply a fertilizer for a series of years. He was delighted to hear Dr. Sturtevant say that farming is more profitable in New England than anywhere else in this country, and this view is confirmed by the statistics gathered by the Secretary of the Massachusetts Board of Agriculture, and published in his "Report." It also finds an illustration in the "Transactions" of the Worcester County Horticultural Society, from which it appears that there were raised in that county, in 1874, 933,000 bushels of apples, valued at $380,000, and that in 1875 one of the members of that society realized from about three acres of strawberries, mainly in a gross income of more than $2,000. Farming in New England can be made profitable, but not without manure.

Mr. Fuller said, that if you always returned to the soil all you took from it you would not thereby avail much, or gain matter from what the ground had in reserve for you before. It would be better, he thought, to ascertain what was needed and add *that* only; and not give all the ingredients of an intended crop.

Mr. Wetherell spoke of the experiments made on the experimental ground of the Cirencester Agricultural College, and reported by Prof. Wrightson, relative to the use of superphosphate, stating that three hundred pounds of ordinary mineral superphosphate per acre gave the most profitable results, it doing best when half of it was drilled in and the other half broadcasted. In the experimenting four hundred pounds and six hundred pounds were applied, the latter quantity in some cases giving no larger crops than three hundred pounds, and in others a little more, but not enough to pay the additional cost, even when three hundred pounds were drilled in and three hundred pounds broadcasted. The speaker quoted Lawes as saying that forty-eight bushels of barley per acre was his best average crop: higher manuring caused it to "run to straw," as farmers phrase it. Every crop has its limit, beyond which it is not economical to endeavor to increase the crop. While he did not doubt that one hundred bushels of corn had been grown upon an acre, he did doubt the possibility of two hundred bushels and upwards per acre. Lawes seemed to succeed in cropping, regardless of rotation. Why not use a rotation of manures, and thus avoid the rotation of crops so generally recommended and practised by

farmers? If the percentage of real chemicals in stable manure be so small as Lawes and Voelcker show, then why not use the former and save the labor of shovelling and hauling the bulk and great weight of the latter?

Mr. Wilder asked if we do not obtain better results from fertilizers in wet seasons than in dry.

Mr. Wetherell replied that we do, adding that the same is true of stable manure. Farmers in Western Massachusetts had paid fifteen dollars per cord and upwards for stable manure.

Mr. Wilder remarked that the idea that we can analyze crops and manures and ascertain what are adapted to each other is sound in principle, but does not always work well in practice.

Dr. Sturtevant spoke of the danger of drawing general conclusions from limited experiments. It does not follow from Mr. Lawes' experiments that it would be proper to act upon his practice in other cases. Hay takes up much water, and land which will not give half a ton of hay may give sixty bushels of corn per acre. The water supply is often as essential to be considered as the dung supply. Lawes has found, but does not pretend to explain it, that nitrate of soda increases the quantity of moisture in the soil.

Mr. Fuller asked whether it produced that effect continuously for several years, and remarked that forcing was always a weakening process.

Dr. Sturtevant said that in twenty-six experimental crops, the first twelve years averaged twenty-four bushels; the second twelve years showed an increase, with complete fertilizers. From a theoretical point of view we have exhausted some element. The prejudice against artificial fertilizers has come from the application of special ingredients. Can a man afford to neglect insurance? When we apply a complete fertilizer we are getting certainty, which may be considered in the light of insurance.

The Chairman announced that the subject would be continued on the next Saturday.

MEETING FOR DISCUSSION.

Saturday, February 23, 1878.

A meeting for discussion was holden at 11 o'clock, President Gray in the chair. Before the subject of Fertilizers, which was the special assignment for the meeting, was taken up, W. C. Strong, Chairman of the Committee on Discussion, remarked that discussions which elicited interesting and valuable information had often been suggested by the articles presented for exhibition, and called on James Comley to say something of some fine new roses exhibited by him.

Mr. Comley spoke particularly of the Souvenir d' Arthur de Sansal rose, the plant of which was grafted in August, 1876, and put in the greenhouse on the 24th of December. He had used a solution of saltpetre for watering both the roots and foliage of his roses; dissolving a piece as large as a walnut in four gallons of water. He thought this the best fertilizer he had ever used for watering roses, and it obviates, to a great extent, the necessity of smoking, which takes the color out of roses. He thought water should be of the same temperature as the air of the house; he believed that more roses were killed by cold water than in any other way. He would not give much water for three weeks after bringing into the house. Growers are too apt to neglect their plants after forcing; care should be given, as with a grapevine, that the wood becomes hard and well ripened. If single specimen flowers are wanted they should be pruned long; if clusters are desired they should be pruned closely. Mr. Comley said that while many growers thought only of the money to be made on their roses, he cultivated them partly from the love of them. Many roses that are very beautiful are not profitable. Many of the new French roses are not as good as the English varieties. Some of the new kinds will surpass the old ones in freeness of flowering, which is a most important point, and in color. He would first see to the growth of the plants, and make them grow as much as he could before the first of June, and after that would plunge them out of doors. He thought as good roses could be produced in eight weeks after bringing the plants into the house, as in a longer time. He has a plant of Sir Garnet

Wolseley, which made eight shoots, averaging twelve feet in length, and expects that next year it will be a splendid specimen. It is probably on the Prince's stock, which he prefers to the Manetti. In England they grow too coarsely out of doors on this stock. Mr. Prince grows the best roses in England; his stock is only a selected Dog rose. Instead of collecting old Dog roses from the hedges he sows the seed and grafts the seedlings when they are one year old. The grafts grow more vigorously than on other stocks, and healthy stocks do not send up suckers. The speaker would never plant Hybrid Perpetual roses on their own roots, either for forcing or for out-door culture. He planted a bed of roses for Mr. Merriam, of Lexington, in common garden soil, spaded about twelve inches deep, which produced some of the finest roses he had ever seen. These were on the Prince's stock. Mr. Comley said that he would prefer perfect medium sized roses to those almost as large as cabbages. In applying manure he would keep it near the surface, so as to attract the roots where they would have the benefit of the sun and air. He thought we have among our wild roses as good a stock as Prince's; it makes many fibrous roots. He had saved half a bushel of the seed. For forcing he thought a plant on the Prince's stock better worth a dollar, than one on the Manetti is worth twenty-five cents. There is great risk in forcing new roses; he has four kinds out of thirty-six which have not a single flower. Their hardiness is also uncertain. He would not care if it took half a day to cover up a fine rose. We lose a great many beautiful things because they will not take care of themselves. Mr. Comley gave the following list of roses, which he considered the best new varieties: Abel Carrière, Duchesse Amélie, Duchesse de Vallombrosa, Jean Liabaud, Jean Soupert, John Fraser, John Stuart Mill, Madame Auguste Revilliod, Mademoiselle Émilie Verdier, Rev. J. B. M. Camm, Royal Standard, Souvenir d' Arthur de Sansal, Souvenir de Louis Van Houtte.

M. H. Merriam corroborated what Mr. Comley had said about his roses. He had never seen the equal, for abundance, of the best crops of flowers, and it has been well maintained. They have received the approving awards of the Society. He was never troubled with suckers until the last season, and perhaps their appearance then was owing to not giving sufficient care to the grafts. The *sine qua non* in forcing roses is an abundance of well ripened wood. Mr. Merriam said that he had corresponded with

Professor Stockbridge in relation to special fertilizers for roses, and was of opinion that the use of iron in some form is desirable. He had seen fugitive paragraphs recommending its use. Whatever the color of roses there is always a notable presence of iron in the flowers. It also gives vigor to the growth and color to the foliage. He believed, also, that the exhalations from ammonia, placed on the pipes in the greenhouse, were advantageous.

The subject of "Fertilizers," assigned for this meeting, was then taken up, and John B. Moore was called on as a cultivator who, whether he showed a rose, a strawberry, or a grape, had evidently given it something to eat which it liked.

Mr. Moore said that the question how to get manure is the most important one which farmers and gardeners have to meet today. We can grow crops if we can get manure, but the manure must not cost more than the crops. There is a difference of opinion among cultivators as to stable manure and chemical fertilizers. Some say "we will use only manure," meaning animal excrements, and some say "we will use only chemical fertilizers." In the view of the speaker both classes were wrong. He believed that every farmer should save all the dung and other waste of the farm for manure, and buy all that his means would allow. But this source of manure is soon exhausted, yet the farmer finds the wants of his land unsupplied, and he must have something more. From his own experience and from the study of scientific books an intelligent farmer will come to the conclusion that each crop must have some special fertilizer. There is no doubt that certain crops require a larger amount of some particular element than is supplied by stable manure. Onions, for instance, require a large quantity of potash, as is shown not only by chemical analysis, but by the fact that there is no better fertilizer for onions than wood ashes. They also require sulphur, and this and the potash may be conveniently applied in the form of sulphate of potash. The speaker advised farmers, instead of buying mixed fertilizers, of the genuineness of which they could not tell anything, to buy the particular articles which their crops need. Dealers say "If you will apply the complete fertilizer you will be all right," but they know nothing of the various soils to which it is to be applied, and are like a physician attempting to prescribe for a patient fifty miles away. Farmers should not leave it to other men to tell them what they should themselves know

about their land. They must use their own brains, and, while not relying on chemists, should avail themselves of their labors. Chemists can tell what is good for crops, but they cannot tell as well as the farmer, what his soil needs. It is an impossibility to make an analysis of a soil which shall be of value to a farmer; a soil may show, by chemical analysis, much potash when there is none in a form available for plant food. It does not require a great deal of knowledge or a great deal of time for a farmer to post himself up by study of the analyses of crops by Professor Goessman, or of other analyses which he will find in chemical works, so that he can buy understandingly all the simple elements that he needs, and apply them to his crops. The farmers must use barnyard manure as the basis of the plant food for all their crops, and then apply the particular element required by any crop in greater amount than is needed for other crops, or than is supplied by barnyard manure. They must use their own brains, and study their own soils.

N. B. White said that Prof. Atwater's advice to farmers not to use complete fertilizers, but to experiment and ascertain the needs of their soils, reminded him of the mother who would not let her boy go into the water until he had learned to swim. Farmers cannot wait to find out about their soils by experiment. Mr. White believed that none of the soils in New England had an excess of any of the elements of plant food, and therefore thought well of complete fertilizers.

The Chairman of the Committee on Discussion announced that as next Saturday was prize day for Hybrid Perpetual Roses, the subject of forcing roses would be again discussed.

BUSINESS MEETING.

Saturday, March 2, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President Gray in the chair.

The Secretary read a letter from John G. Barker, resigning his position as Chairman and member of the Committee on Plants and

Flowers. On motion of Hervey Davis it was voted that the resignation be accepted.

On motion of John C. Hovey, it was unanimously

Resolved, That the thanks of this Society be extended to J. G. Barker, for his long and faithful services as member and Chairman of the Flower Committee.

It was moved by William C. Strong that the polls be opened for twenty minutes for the reception of votes for a member to fill the vacancy caused by the resignation of Mr. Barker. E. H. Hitchings moved to amend this motion so as to provide for the choice of a member of the Flower Committee. The Secretary stated the usage in similar cases, and the motion, as amended, was carried.

On motion of W. C. Strong, it was voted that the Committee on Plants and Flowers be empowered to elect a chairman.

The President appointed John C. Hovey, W. C. Strong, and E. H. Hitchings, a Committee to receive, assort, and count the votes for a member of the Flower Committee. Mr. Hovey declined, and E. W. Buswell was appointed in his place. The polls were opened at fifteen minutes past eleven.

On motion of W. C. Strong, it was

Voted, That the Recording Secretary be directed to place on record the Report of the Committee to procure a site for a new Hall, presented February 7, 1863, and also the letter from E. S. Rand, Sr., accompanying said report.

W. C. Strong, Chairman of the Committee to present a Testimonial to Ex-President Parkman, reported that the Committee had procured and presented to Mr Parkman three crayon photographs, as an expression of the Society's appreciation of his services as President. In this connection Mr. Strong spoke of the high estimation in which the hybrid lily raised by Mr. Parkman, and bearing his name, is held in England, as evinced by the large remittances received from the English nurseryman to whom the bulbs were entrusted for propagation.

Marshall P. Wilder expressed his gratification that Mr. Parkman had, by the application of scientific principles, been able to produce such a lily, which he deemed a great credit to the Society as well as to Ex-President Parkman.

Mr. Wilder said that having worked with the Society for nearly

fifty years, and being desirous of leaving some footprints on the sands, he had collected his addresses and other writings, from 1848 to 1877, and caused them to be bound into a volume, which he presented to the Society, in the hope that it might cause him to be remembered with affectionate regard when he should have passed from the stage. He also presented a Wilder Medal of the American Pomological Society, bearing his own likeness and the beautiful wreath of fruits and flowers, designed by John J. Thomas, the eminent pomologist, and said that the American Pomological Society, now extending over the whole country, was formed at the instance of the Massachusetts Horticultural Society.

William C. Strong expressed his gratification that Mr. Wilder had collected these addresses in a permanent form, and moved a vote of thanks to this old and steadfast friend of the Society for the volume and medal.

Rev. A. B. Muzzey seconded Mr. Strong's motion. He looked on Mr. Wilder as the representative of our work, not only in a State but in a National point of view, and said it was not likely that we should often have an opportunity to recognize such a long, active, and honorable life in the service of horticulture.

President Gray, in putting the question on the motion offered by Mr. Strong, took occasion to express his appreciation of the value to the Society, and to horticulture generally, of the services rendered by Mr. Wilder in the long and active life commemorated by the documents and medal. The vote of thanks was unanimously passed.

The President read the following communication received by him :

The undersigned, interested in advancing a practical taste for Floriculture, especially among the children of the laboring classes, desire that the Massachusetts Horticultural Society shall offer prizes for Window Gardening, and conduct all the business of advertising, exhibiting, and awarding prizes, necessary to insure success.

Rufus Ellis,
Henry W. Foote,
C. A. Bartol.

The President stated that the measure would involve no expense to the Society. It was

Voted, That the Flower Committee, with Mrs. J. W. Wolcott,

Mrs. C. N. S. Horner, and Mrs. E. M. Gill, be a Special Committee to fix and award prizes for Window Gardening, agreeably to the above communication, and to conduct all the business necessary to insure the success of the object therein proposed.

The polls for the election of a member of the Flower Committee were closed at twenty-five minutes before twelve, and the Committee to receive and count the votes reported as follows:

Whole number of votes,	104
Henry Ross had	75

and was declared elected a member of the Flower Committee.

Meeting dissolved.

It was intended to hold a meeting for the discussion of Rose Culture at the close of the business meeting, but so much time having been consumed by the unusual amount of business, and the principal rose-growers being more interested in the beautiful exhibition in the Hall than in the discussion, it was postponed until the next Saturday.

MEETING FOR DISCUSSION.

Saturday, March 9, 1878.

A meeting for discussion was holden at 11 o'clock, President Gray in the chair. Subject, Rose Culture.

William C. Strong alluded to the remarks made by James Comley at the previous meeting concerning stocks for roses, and especially the Prince's stock. These remarks suggested an inquiry as to the cause of the diseased condition of the Maréchal Niel rose, when budded on other stocks, particularly the Manetti, the wood swelling and cracking. This raised the question as to the proper stock for that rose, and opened the whole subject of the mutual influence of the stock and graft. The influence of the graft on the stock is plainly shown in the abutilon. The speaker had budded the *Abutilon vexillarium pictum* on the plain type, and the bud so inoculated the stock that a shoot springing out several feet below the graft was variegated, though showing the type of the large

leaf. The wood of the Manetti is so different from that of the Maréchal Niel, that it is unfit for a stock for that variety. We should seek for stocks similar in texture to the graft. The Laure Davoust he thought well suited for a stock for tender roses.

Mr. Strong recurred to the subject of the mutual influence of stock and graft, and said that it was of great interest to all cultivators. Much disappointment had been experienced in the use of the quince as a stock for the pear; it is not as hardy as is desirable, is subject to the borer, and requires a rich soil. Mr. Strong had been engaged in the culture of the *Cydonia Japonica* for hedge purposes, and was led to consider its fitness as a stock for the pear. It is thought by botanists to be more closely allied to the pear than is the common quince, being sometimes placed in the genus *Pyrus*. When grown for hedges or ornament it is propagated by cuttings of the root, and forms irregular bushes, with many suckers; but when grown from seed it makes clean, handsome plants. It is not a free fruiting plant, but the speaker was fortunate in obtaining a sufficient quantity of the seed to raise fifteen thousand plants, which averaged two feet in height the first season, but were not as stocky as pear seedlings. A small quantity of *Cydonia Japonica* seedlings were budded last summer with pears, which took perfectly, and the buds look as well this spring as those on the pear. The indications are so favorable that Mr. Strong was encouraged to hope that this is destined to become a valuable stock for dwarf culture of the pear. For the purpose of proving this question he has planted out two acres of stocks for budding this summer. The Bartlett pear does not succeed on the quince, for the same reason that the Maréchal Niel does not succeed on the Manetti stock—the difference in the texture of the wood. The late John Fisk Allen, who exhibited very large Seckel pears, believed that their size was increased by grafting on large fruited varieties, like the Beurre Diel. Roses on Manetti stocks produce larger flowers than those on their own roots, except very strong growing kinds. In answer to an inquiry by Marshall P. Wilder, Mr. Strong said that he had not observed any other plant than the abutilon where the stock was inoculated by the scion.

Mr. Wilder said that the influence of the variegated abutilon on the stock had been noticed in Europe, but that it was not always certain. He had tried the experiment himself, and all the shoots from the stock came without variegations. There is no doubt that

it is desirable to have an affinity between the stock and scion, but the subject is little understood. He believed that the character of the cellular tissue of wood had an influence on the graft, and that when the texture of the scion and stock did not agree they would not succeed. There are some pears, such as the Cross, which seem to kill every stock they are grafted on. He had had two vigorous Doyenne Boussock trees killed by grafting with Cross; it seems to poison them. At present we can only ascertain by experiment whether a scion and stock are suited to each other, but the instances mentioned are sufficient to show that there is an influence of the scion on the stock, as well as of the stock on the scion. The Beurre Bosc pear makes long roots, but when grafted on other kinds it produces a mass of fibrous roots.

Mr. Strong remarked that the Cross pear would not kill the stock if suckers were allowed to grow.

President Gray said that there is no doubt that variegated pelargoniums, when grafted on plain kinds, sometimes cause the stock to send out variegated shoots. The best plant of Maréchal Niel that he had ever seen was on the Lamarque stock, and was probably double-worked. He alluded to Mr. Strong's statement that the seedling plants of *Cydonia Japonica* are far more vigorous than those raised from cuttings, and said that the Prince's stock for roses was simply a Dog rose raised from seed, by which a new plant, from top to bottom was obtained. Plants grafted on it grow well for two or three years, without suckers, and should be planted deep enough for the graft to make its own roots. For two or three years you get better roses from the Manetti; by that time they have made their own roots. In England every rose is grafted on the stock which experience has proved best adapted for it, and hence in a lot of imported roses we find a variety of stocks.

Mr. Wilder said, in reply to an inquiry by Mr. Strong, that the Manetti rose had flowered and produced seed in his grounds. It has a semi-double flower.

President Gray alluded to Mr. Comley's statement at the previous meeting, that he had saved seed from a brier growing in a swamp. He would prefer seed from a plant growing in a well drained place, to raise stocks for budding roses on.

Mr. Strong asked if any one had had experience in the use of our native Dog rose as a stock.

Mr. Wilder wished to know whether stocks procured in the fields could be relied on as being all of the same variety.

Mr. Strong thought that though roses sport when grown from seed, they could be relied on as stocks. At Mr. Wood's place, in Natick, he saw two fine plants of Maréchal Niel said to be on Dog rose stocks, but he thought they were not adapted to this variety.

C. M. Atkinson endorsed everything that the President had said. The Prince's stock is not as distinct as the Manetti; it is nothing but the English Dog rose raised from seed. The wide hedges of weeds, brambles, etc., from which roses for stocks were formerly procured in England, are now being removed and wire fences substituted. Consequently Dog roses are getting scarce, and Mr. Prince, who is a nurseryman, seeing this, has gathered the hips and grown them from seed, producing a better stock than the wild ones formerly collected, but it is not adapted to weak growing kinds. It is necessary to ascertain by trial what stock is adapted to each variety. Some kinds will not throw out roots from the grafts, but most will after twelve months. He did not want a kind that would not root from the graft. In his opinion the Dog rose requires too long a state of rest to be adapted for a stock for tender roses for house culture. Laure Davoust, Lamarque, and Solfaterre are better, and the Banksian is best of all. He did not think the Dog rose of this country worthy of consideration as a stock; the wood is small and wiry and the bark hard.

Mr. Strong dissented from Mr. Atkinson on the last point. He thought our Dog rose quite as strong as the English. He could show Mr. Atkinson hundreds of specimens that he would have to look up to.

President Gray said that nobody takes proper care of roses on their own roots. They will take a great deal more feeding than grafted roses. He did not think weak growing kinds worth cultivating.

Robert Murray had never been able to make a bud grow on the native rose.

M. H. Merriam thought that in cases of variegation the affinity between the stock and scion is very close, and this goes to strengthen the point urged here of the desirableness of such affinity. His roses are all grafted on the Prince's stock, and he believed that with weak growing varieties the stock would assert its pre-eminence, and must be very closely watched. He had lost many by neglect, but the strong growing kinds are as good as ever. He thought none had got on their own roots, though planted sufficiently long.

Mr. Strong agreed with the President that for general purposes it is better to have roses on their own roots, but for the florist would have some kinds on Manetti or other stock of vigorous growth. The roots will absorb more water and endure more variations.

President Gray said that in his previous remarks he referred only to out-door roses.

Mr. Strong, as Chairman of the Committee on Publication and Discussion, announced that Part II of the TRANSACTIONS of the Society for 1877 was ready, and could be had on application to the Secretary, and that on the next Saturday the subject for discussion would be the Culture of Small Fruits.

MEETING FOR DISCUSSION.

SATURDAY, March 16, 1878.

A meeting for Discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, in the chair.

The subject assigned, the Culture of Small Fruits, was opened by A. D. Capen, who spoke particularly of the strawberry, and remarked on the necessity of constant care and watchfulness on the part of those who attempted the cultivation of this fruit, and on the importance of novices' learning all they could from the experience of others. Mr. Capen spoke of the great difference in the results with the same variety in different locations, and instanced the north and south sides of Charles River. He could not do anything with the Hovey's Seedling, but succeeded with the Charles Downing. His great difficulty had been in feeding his plants; he had got too much foliage. The Charles Downing was in season for a long time with him, beginning to ripen earlier and continuing later than most kinds. He had had this variety with leaf stems fifteen inches long, and the fruit stems from ten to fourteen inches long, and standing more thickly than he had ever seen elsewhere. The crop was found to be from six to seven thousand quarts per acre.

The Chairman read from the last report of the Fruit Committee the following: "Much has been said in favor of the Monarch of the West, Star of the West, and the Great American, but we believe either of those raised by Mr. Moore is in all respects superior to any of them." He inquired whether the varieties named, and especially the Great American, were so well tested as to warrant the comparison.

Benjamin G. Smith, a member of the Fruit Committee, replied that the specimens exhibited were from plants set last spring.

The Chairman regretted the expression, and thought that we should be very careful in regard to giving opinions on fruits that we know little of.

E. P. Richardson was disposed to think the Monarch of the West better than was implied in the report of the Fruit Committee. One of his neighbors who has cultivated it with the Wilson, is inclined to substitute it for the Wilson as a market variety. The specimens shown at our exhibition were very large, but of poor color.

Mr. Smith said that he had given special attention to the culture of the currant and gooseberry. He found it impossible to produce the best results without vigorous foliage. He trenched and enriched his soil to the depth of from twenty-four to thirty-six inches. He mulched his gooseberries with salt hay, and used a solution of sulphur and lime to prevent mildew on the foreign varieties. He pruned very severely, shortening the young wood, excepting the terminal shoots, to one or two eyes. For strawberries he had used a compost of one-fourth hen manure and three-fourths leaf mould. He had found the Dorchester blackberry extremely liable to be winter-killed.

The Chairman remarked that the Wachuset Thornless blackberry had been highly recommended in Worcester county, and called on O. B. Hadwen, Ex-President of the Worcester County Horticultural Society, for information as to its character.

Mr. Hadwen had seen it under very favorable circumstances, and producing abundant crops. He had seen a row two hundred feet in length covered with a larger crop of fruit than he had ever seen on any other variety, wild or cultivated. It is perfectly hardy. It is grown largely by Thomas A. Dawson, of Worcester, and Mr. Hadwen had visited his grounds, and had never seen one winter-killed. Mr. Dawson's soil is a light loam. The Wachuset is not as large as the Kittatinny, but fully as large as the Dorches-

ter, and very good in quality. It should not be grown in the shade. Mr. Hadwen considered it perfectly hardy, and a promising variety.

Mr. Hadwen then spoke of the strawberry, which, he said, stands first on the list of small fruits, being the most acceptable berry to every one. Many varieties have had their day, and passed away. In Worcester county the Charles Downing is recommended as the best variety, where only one kind can be planted. It combines more virtues and has fewer defects than any other. It is productive, and acceptable in the family, and fair for the market. It adapts itself to a great variety of soils and adverse circumstances. The Wilson still stands first for market only.

Mr. Smith remarked that in Cambridge the Charles Downing succeeded on a sandy soil, but failed on clay, and asked Mr. Hadwen whether the case was the same in Worcester.

Mr. Hadwen replied that his soil is a stiff loam on a clay subsoil, and that the Charles Downing succeeds admirably in it.

J. S. Martin said that the Charles Downing succeeded well in his soil, which is sandy.

Mr. Hadwen went on to speak of the best time for planting strawberries, which, under ordinary circumstances, he considered the spring. It is not only better but cheaper to plant then. If neglected in spring it may be done in autumn, but if deferred until that time the plants must be taken up with balls of earth, put in rich ground, and watered. Market gardeners would not plant in autumn, for it would cost three times as much as in spring, and the risk of failure would be much greater.

Mr. Martin had planted in autumn and found no difference in the cost, and had never lost a plant.

Mrs. H. L. T. Wolcott had planted strawberries in summer, after taking off a crop of early peas. They bore well the next season, and a year's time was saved by fall planting.

The Chairman said that, owing to the greater care required, the cases of fall planting must be limited to a small extent. In the instance mentioned by Mrs. Wolcott, an important advantage was undoubtedly gained by fall planting.

Mr. Capen asked whether Mr. Hadwen would take up a ball of earth with his strawberry plants, if he were setting out an acre.

Mr. Hadwen did not suppose that any one would think of planting an acre of strawberries in autumn. Besides the disadvantages

previously mentioned, is the much greater danger of their being thrown out by frost than if planted in spring. In his remarks he had reference to Worcester county.

Mr. Capen spoke of a neighbor who planted an acre of strawberries with selected plants, drawing the roots through his hand, and setting in a hole made with a dibble, pouring in water at the same time. The speaker preferred not to use a trowel or dibble; he wanted the soil so thoroughly pulverized that he could set the plants with his hands. He had a man to precede the planter, and fork over that part of the ground where the rows would come, and called him back whenever he found a lump. He pulverized the soil between the rows with a plough afterwards. He wetted the roots of his plants before setting, and had had a better crop of Downing, Cutter, and Hooker, the first year, from plants set in May, than is often seen on beds set a year. He considered the middle of May early enough to plant strawberries, and would wait longer if it was very dry at that time. On plants set as late as the second of June he had had a fine crop the next year.

Mr. Hadwen was asked whether the statement in the "Transactions of the Worcester County Horticultural Society," that William H. Earle had received for the produce of three acres of land, a large proportion of which was strawberries, more than two thousand dollars, was correct. He replied that it was, and gave some account of Mr. Earle's method of cultivation. He plants in rows, three rows in a bed, the middle one being eighteen inches from each of the outer ones, and the plants twelve inches apart in the rows. He leaves a space of two feet between the beds, which are three feet wide. His land is favorably situated, at the base of a hill. He cultivates deeply, manures highly, and neglects nothing that will afford food to the plants. Late in autumn he mulches heavily with pine leaves, hay, or straw, and leaves the mulching on late in the spring, especially for late kinds, and even then the mulch is not wholly removed, but only a small space is opened over the crown of each plant, a portion of the mulch being left between the rows. In this way the fruit is kept clean, and always presents a bright, attractive appearance. He sets out his plants in the spring, allows no weeds, and does not cultivate until the crop has been gathered. He cultivates by hand, using an implement with a wheel. He gives the plants a great deal of water. Mr. Hadwen added that the best results in strawberry culture could not be attained

without great care, but it pays. Strawberries will not endure neglect.

Marshall P. Wilder, alluding to the statement that Mr. Earle gives his plants a great deal of water, spoke of the remark made by John B. Moore at one of these meetings, that he turned the Concord water-works on to his beds, until they were so wet that the foot sank in six inches in walking over them. Mr. Wilder also reaffirmed a statement of his own, quoted by Mr. Earle in his essay in the Worcester Report, that the first, second, and third things in strawberry culture were water, more water, and still more water, during the growing season.

Mr. Capen said that in strawberry culture, as with many other pursuits, we hear of the successes, but not of the failures, and he thought Mr. Earle's success an exception to the general rule. Mr. Capen said that he made his rows four and a half feet apart and let the plants run. They cover the ground so that alleys have to be cut between the rows. He thought that the plants needed stimulants before water.

N. B. White would add one other condition — thorough drainage. He wetted the roots of his plants as Mr. Capen did, and set them on the same plan as Mr. Earle. His land was underdrained to the depth of three feet, and currant bushes planted in it attained a diameter of an inch in three years. If he were selecting a new place he would look out for good drainage and plenty of water. Fall planting had so many disadvantages that he would not recommend it. The Monarch of the West did not favorably impress him the first year, but the plants were hardy, rooted deeply, and endured dry weather. Mr. White alluded also to his success in grafting grapes, first cutting the roots so as to prevent a redundancy of sap.

The Chairman agreed with Mr. White that the habit of growth of the Monarch of the West is exceptionally vigorous. The berries are fair and symmetrical, but not abundant or of first quality. The soil on which his plants grew is a deep alluvial—fine for the growth of plants.

Mr. Wilder thought the autumn a very improper time to plant strawberries. He had never had sufficient success at that season to pay for the labor of planting.

The Chairman thought it might be desirable under certain circumstances. He alluded to the method recommended by Peter

Henderson of preparing plants for forcing, by laying the runners in small pots. The speaker thought it better to pot young plants in spring, and shift into larger pots as the plants grew, by which large, fat crowns, full of fruit buds, would be ready when wanted for forcing. He thought that forcing strawberries might be made profitable. He believed also that they might be forwarded to advantage in cold graperies, and called on E. W. Wood for his opinion on this point.

Mr. Wood thought there would be but little time gained. He had commonly taken up his grape vines from the twelfth to the fifteenth of April, and it is not desirable to give extra heat before that time. In March he throws open the windows of his grapery at top and bottom; to keep them closed would injure the vines.

Mr. Wood spoke of the importance of these discussions as a means of diffusing information as to the best varieties of fruit, and especially as to the value of new fruits. The only opportunity to judge of new varieties is at the exhibitions, and it is impossible to tell from merely seeing a fruit whether or not it is desirable for general cultivation. He had been disappointed with the results of his own cultivation of Mr. Moore's new seedling strawberries, of which he had tested three varieties. From a row of the Belle, two hundred feet long, he did not pick a peck of berries, and the plants came out stinted in the spring, and the leaves curled. His experience was the same last year, but perhaps the plants need the "Concord sand," in which Mr. Moore says he grows his strawberries. Mr. Wood's soil is a strong loam with a clay subsoil.

Last year Mr. Wood tried the experiment of planting strawberries in August, though he had previously believed it useless to set them at that season. A crop of early potatoes had just been taken from the ground. He dibbled a hole and filled it with water, and did not lose a dozen out of seven or eight hundred plants. He learned the method from a vegetable grower.

Mr. Smith, being asked his experience with the varieties of strawberry mentioned by Mr. Wood, replied that it was the same as Mr. Wood's. The Grace produced a fair crop and the Caroline an abundant one, while the Belle proved a shy bearer.

Mr. Wood spoke of the Versaillaise currant as a good grower, and an abundant bearer, while a row of Dana's Transparent, alongside of the Versaillaise, had produced but a very small crop.

The Chairman remarked that many persons considered the Ver-

saillaise and Cherry currants identical, but in his view there was a difference in the foliage.

Mr. Smith said that some years ago he exhibited fruit of the Versaillaise currant, which grew on plants procured from William H. Barnes, who had the variety from Marshall P. Wilder, who originally introduced it into this country. The basket was decided by the Fruit Committee to contain a mixture of the Versaillaise and Cherry, and consequently Mr. Smith failed of the prize, which, he thought, would otherwise have been awarded to him. The next year a row which he had for the Cherry currant bore fruit, and he selected the long bunches from both rows, exhibited them as Versaillaise, and received the first prize. The London Horticultural Society had instituted a careful test of all the reputed varieties of the currant, and the conclusion, as respects the Cherry and Versaillaise, was that they are identical.

Mr. Wilder said that many years ago he imported from Europe a large number of varieties, including the Cherry, Versaillaise, and Fertile de Palluau, from M. Bertin, the originator of the Versaillaise. The Cherry and Versaillaise are very much alike except in quality, the former being decidedly more acid than the latter. Both have long and short bunches, but those of the Versaillaise will average longer than those of the Cherry. The American Pomological Society has decided that the Cherry is inferior in quality to the Versaillaise.

The Chairman said that the Cherry is more acid and watery than the Versaillaise. The growth of the Cherry as compared with the Versaillaise, is more stubbed and shorter jointed, the habit of growth resembling that of the Seckel pear as compared with the Bartlett. He had his plants from M. Transon, of Orleans.

Mr. Wilder said that the statement of the Chairman concerning the difference in growth of the two varieties was correct.

Mr. Hadwen had plants under both names from the late John Milton Earle, well known as a most accurate pomologist, and for many years thought them different, the long bunches being Versaillaise and the short, Cherry, but closer examination showed that there was not as much difference as he supposed. He found both kinds growing in the same row, and he thought that the more closely we observed the less difference we should find. If the difference is so slight as to puzzle the most careful horticulturists, it is of little consequence. To show how the same kind is liable to vary, Mr. Had-

wen said that a gentlemen in Worcester exhibited what appeared to be five different varieties of tomato, from one plant. The White Gondouin, Mr. Hadwen thought quite distinct from any other currant, in berry and bush, and with a decided difference in flavor. It is not as prolific as the White Grape, but it is the sweetest of all currants.

The Chairman announced that the subject would be continued on the next Saturday.

MEETING FOR DISCUSSION.

SATURDAY, March, 23, 1878.

A meeting for discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The subject was the same as that of the last meeting, the Culture of Small Fruits.

The question of the identity of the Versaillaise and Cherry currants came up again, and was discussed at some length, the opinion that, while they strongly resemble each other, they are, nevertheless, distinct, decidedly preponderating. N. B. White thought that nurserymen had the two varieties mixed. The Chairman said that it was easy to perpetuate confusion when once introduced among varieties resembling each other. He had noticed a difference in the wood and habit of growth of the two varieties, yet it was easy for the best judges to mistake in fruit exhibited. He had a large plantation, partly Cherry and partly Versaillaise, which he should examine more closely than ever before, and he thought that after hearing what had been said in regard to these two currants we should all put on our glasses and watch them with more care.

The Chairman remarked that nothing was said of the raspberry in the discussion of the previous week. He thought it a fruit of more importance than the market would indicate. Many new and highly praised kinds were offered, some of which were sold as high as a dollar a plant. Among others little cultivated here, the Brandywine is receiving much attention. On inquiry it appeared that no one present had cultivated this variety.

E. P. Richardson had cultivated the Philadelphia for three or

four years. It is a great bearer, but only second rate in size and flavor, while it is a great deal of work to pick them. Mr. Richardson inquired why the highest prize for raspberries was awarded to the Saunders over the Herstine. He thought the appearance of the latter far superior to that of the former.

E. W. Wood, a member of the Fruit Committee, replied that the Committee were unanimous in the opinion that in quality the Saunders was superior to the Herstine. Mr. Wood referred to the Hornet Raspberry, exhibited for several years by William H. Barnes, which he thought promising. He also spoke of the Narragansett raspberry, a native of Providence, and exhibited here by the originator, from whom the speaker procured plants. These plants bore a second crop, which ripened in October, and he then picked a considerable quantity. The canes which bear this second crop die after it is ripe.

N. B. White and B. G. Smith said that the Hornet has the same characteristic.

Mr. Richardson had cultivated the Narragansett, and discarded it. He thought the Merveille de Quatre Saisons a magnificent raspberry for amateur cultivation.

The Chairman remarked that the Catawissa was the most productive of all the ever bearing varieties, but was valueless for the market.

Marshall P. Wilder said that he imported the Hornet and another variety raised by M. Souchet, more than twenty years ago. The Hornet is the largest of all raspberries; it is not of first quality, but is a strong grower and bears fairly. The other variety raised by M. Souchet was a white one, and bears the name of the originator. It is a most abundant bearer, and, parting freely from the core, is very easily gathered. Mr. Wilder thought he had picked more from it than from any other kind, and regarded it as one of his standard varieties. He did not think the Philadelphia worth growing. Knevett's Giant is a splendid variety. The histories of this and of the Franconia resemble each other, and are quite curious. The Knevett's Giant was sent from England to Mr. Wilder, by Messrs. Chandler & Co., with a lot of camellias. Mr. Wilder afterwards wrote to Messrs. Chandler for more, and was informed that the little bundle sent him was brought in by an unknown person, and was all they had ever had of the variety. The first introduction of the Franconia was by two plants sent by Vilmorin, of Paris, to Samuel G. Perkins, from which all those in the country

have originated. Neither the Knevett's Giant nor Franconia are found in any European Catalogue.

B. G. Smith had grown the Franconia for fifteen years from the same stock, and year before last took the first prize with it.

J. W. Manning questioned whether there had been any improvement in raspberries for the last forty years. He had grown the Franconia an inch in diameter. Knevett's Giant is not as hardy as the Franconia. The Belle de Fontenay and Merveille de Quatre Saisons are very much the same as the Knevett's, in habit of growth, appearance of the fruit, and in bearing a crop in autumn on the new wood.

Mr. Richardson thought the Brinckle's Orange the finest raspberry for family use. He inquired why raspberries sometimes produced fruits with only a few of the grains developed. He thought it probably owing to a defect in the fertilization of the flowers. The Narragansett is particularly objectionable on this account.

Robert Manning said that in raising raspberries from seed, as in raising native grapes from seed, a large proportion of the plants will be entirely barren. Many others will bear only imperfect berries, and there seems to be a tendency in some of the standard varieties towards this condition. The only practical suggestion which the speaker had to make, was that in propagating, suckers should be selected from those plants and stools only which bore perfect fruit. The Franconia, he thought, from its firmness, most valuable for market. Its spirited acid makes it desirable for preserving. After it is gathered its texture and flavor both become mellowed, and twenty-four hours after picking it is better for the table than when just picked. Knevett's Giant is earlier than the Franconia, and fine for family use. It sometimes adheres slightly to the core in picking. The old White Antwerp and Brinckle's Orange are the finest for eating as "hand fruits."

Mr. Wilder said, in answer to an inquiry as to the value of the Black Cap raspberries, that they are earlier than the others (as the children soon find out), and valuable on that account. Davison's Thornless is one of the best.

The Chairman said that the McCormick or Mammoth Cluster is the largest and best of the Black Cap class, and also very prolific.

J. W. Manning agreed with the Chairman, and added that the Souhegan is a new variety and highly recommended.

Mr. Richardson had tested the Golden Thornless and found it worthless. This was confirmed by several gentlemen.

Mr. Wilder said that no "White Black Cap" is worth growing. They are all of a disagreeable "mulatto" color.

Robert Manning alluded to the statement made by Mr. Wood, as to the unproductiveness of the Dana's Transparent currant, which he thought liable to produce a wrong impression. He had two short rows of Versaillaise and Dana's Transparent, side by side, and the latter, though not so vigorous as the former, was quite satisfactory both as to growth and productiveness.

Mr. Wood said that his plants of Dana's Transparent growing among his pear trees, drop their foliage when the fruit is about two-thirds grown, while the Versaillaise retains its foliage.

Mrs. E. M. Gill had had the same experience as Mr. Wood with the Dana's Transparent, though well watered. Red currants, under the same treatment, did not lose their foliage.

Mr. Smith had been very successful with Dana's Transparent; the foliage did not drop. He watered and mulched the plants.

Henry Ross said that Mr. Wood's Versaillaise currants were superior to those which he raised himself. He had grown seven or eight varieties, and thought the Red Dutch the sweetest of all the red currants.

J. W. Manning thought the Lovett's Red or Improved Red, originated many years ago by Capt. Josiah Lovett, a most skilful cultivator, the sweetest red currant. It is a great bearer.

Robert Manning thought the Red Dutch superior in quality to the Versaillaise, and the White Dutch superior to either the Dana's Transparent or the White Grape.

Mr. Wood spoke of seeing fruit of the Versaillaise at Mr. Wilder's grounds when first introduced, and of the skepticism of a friend to whom he spoke of it, as to its being so much larger than the Red Dutch, but who gave up and owned himself beaten when a basket of the fruit was shown him. Mr. Wood thought the Dutch no better in quality than the Versaillaise.

Daniel T. Curtis had seen a berry of the Versaillaise measuring two and one-eighth inches in circumference. He spoke of the skilful culture of the currant and gooseberry by the late Thomas Dowse, of Cambridgeport, who preserved the fruit on the bushes until October.

The Chairman announced that an Essay on "Peat as a Fertilizer and an Absorbent," would be read by H. Weld Fuller, on the next Saturday.

MEETING FOR DISCUSSION.

Saturday, March 30, 1878.

A meeting for Discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following essay was read by the author, H. Weld Fuller, of Boston: —

Peat as an Absorbent and as a Fertilizer.

Agriculture is admitted to be one of the great pillars of the state. The health, the wealth, the contentment, growth and happiness of a people depend upon it for support. Without the ploughshare and pruning-hook, the sword and lance would become useless in war; and in peace there would be no fixed habitations and little increase in population. But, to lift us above the savage life, agriculture must have brains and manures. The farm requires a good supply of both. He is the best farmer who uses both to the best advantage. Soils are as various as the persons who till them; and the true farmer will study their temper and make the most of them. Science is the economy of force — lessening work and increasing the results. If the husbandman would better his own condition, or the condition of his poor lands; if he would keep his good lands, or himself, in good heart, or honestly get much out of little, or more out of much; if, in a word, he would live and thrive by his products and not impoverish his place, he must farm with brains and manures.

Good husbandry is based on manures, rightly prepared and rightly applied. When nature stores away the phosphates in the hill-side, or fills our swamps or lowlands with nitrogenous matter, she leaves it for us to find out their value and profit by them. She is often lavish of materials; but her beneficiaries may use or abuse them as they please. Some soils consist almost wholly of vegetable remains, so apparent to the eye that we might naturally regard them as just fitted for immediate use; whereas, their worth depends upon their preparation and skilful application. Such are the different varieties of Peat, of which I would now speak.

These are, as we all know, of several kinds; the mild, the sour, the coaly, etc. In other words, the fuel peat, the black muck, etc.,

each kind having some qualities peculiar to itself, but all containing the most essential requisites for a good manure. The peat which has long been used for fuel, is that tough, spongy and fibrous compound in low lands or bogs, which bends under the feet and retains its shape when dug or cut. It abounds in the country, and here in Massachusetts, of late, machinery has been introduced and is now operating to remove, grind and manufacture it into fuel, entirely regardless of other uses. The ashes of this kind of peat, as well as that from marshes near the sea, have for more than a century been sought as fertilizers. In Holland and elsewhere, peat has often been burnt merely for its ashes, which were sold by the bushel for manure; the farmer losing thereby all the volatile portions best adapted to his plants. Nevertheless, as more or less of calcareous matter was contained in the ashes, they were good for sandy soils, and the waste was not total. If skilfully mixed with animal manure and properly decomposed, this variety is deemed the most valuable.

The brown or black muck, which is more common with us, differs from the fuel peat, in being softer and more decomposed. It consists mostly of decayed and decaying vegetable matter, with some earthy and mineral admixture, and is nearly in the state of vegetable mould, or "*humus*," sometimes called "*geine*." The value of this muck depends very much on its position. If it has been continually subject to drainage and leaching, much of its virtue may have run off and little remain. But if it has been confined within a flat basin, without any outlet or overflow, and not too much flooded, it will retain its tannin, nitrogen, and fertilizing salts, which may be converted into the best of plant food.

All peat is a concentrated vegetable carbonaceous compound. The average muck of Massachusetts contains, as found by analysis, twenty-nine parts of soluble matter and about fifty-five parts of insoluble; about one-third its substance being soluble. It is capable of holding much moisture, and, when dried in the sun, still contains about two-thirds of its weight of water. It has organic matter, and often acids, in excess; although its principal ingredient is carbon. Oxygen and highly nitrogenized crenic and apocrenic acid, are always present, with traces of ammonia. But in its fresh state, it is almost inert. To utilize it, therefore, animal manures or salts should be employed to quicken its action. *Air* and *water* are to do the most of the productive work; and they are so essential in

vegetation that whatever manure appropriates these elements to the greatest extent may be regarded as the most beneficial. Four-fifths of all growth comes from them. Some chemists have contended that water is the only dressing needed; that the overflows of the Nile and of our meadow streams, which annually enrich the lands, bring to them nothing very fertilizing except the water; and that the amount of water retained by a manure is a good test of its quality, as the air is constantly co-operating with it to prepare the needed food. We cannot well over-estimate the importance of either of these elements. Although only one-fifth part of our common air consists of oxygen, yet so essential is the supply of oxygen in nature, that more than one-half of the weight of all the solid rocks of the globe is composed of it; without it, there could be neither life nor decay. Oxidation and decay cannot proceed without it, and they are the only sources from which come the renewal and supply of all vegetable matter. Decay is a species of oxidation or slow combustion—a consuming or burning process, whereby a change is effected as by heat; the color of a substance is changed and darkened by it, as if slightly charred, and finally it falls to powder. Too much water will check this decomposition, but a good quantity is needful.

Peat is fertilizing matter undecomposed, or matters in which decomposition may have commenced. Indeed, fermentation is necessary to bring out its virtue. Generally, the blacker the peat, the better it is; and that kept longest is best, provided it has been kept out of the bog and has not been fire-fanged or flooded. But it must be decomposed before it is available for plants; fresh peat is not to be ploughed under and immediately mixed with the earth. A peat-bog may be thoroughly drained and ploughed, yet, rich as it is in material, the first year's product will be disappointment and failure, for the soil will be sour and undecomposed, and in no condition for plant growth. The application of plaster of Paris, or lime, in moderate quantity, would be beneficial in such ground by decomposing the soil and bringing into activity its humus and insoluble matter. But if the soil is too rich in humus, there is danger of forming thereby an injurious humate of lime, and also of setting free too much corrosive sulphuric acid. On clayey grounds, excepting in warm and wet seasons, gypsum is of little account. On sandy or gravelly lands, applied just before or after a rain, it succeeds well. It must not, however, be often repeated or long

applied to the same land without the use of animal manures. And the same may be said of the use of fertilizing salts.

They are good in their season; but animal manures are indispensable. All plants, except fungi, require alkalies and alkaline earths. They must be supplied with both organic and inorganic matter, and that, too, in a condition for use. They feed in a mysterious way, on infinitely small particles, and have a choice of these. They select from among the particles of inanimate matter the parts they need, and which will combine and assimilate only under fixed conditions and limitations. They refuse, during life, to obey the chemical laws which govern organic matter, but after death they become subject to them, and dissolve accordingly. While they live and grow, they appropriate and organize inorganic matter. They never directly absorb organic matter, and yet they cannot grow in a soil without it. A good soil will contain about one-fifth part in weight of such matter; but the plants will drink only the gases, and wait for the dissolution of the compounds. The volatile portions of all their reserves are the most valuable, and water helps to generate them and retain them for use. It brings to them carbon and ammonia in right proportions. Rain mechanically opens the earth anew, and sweeps away the useless and inert air and other matter, with some noxious compounds, making room for, and introducing new and fresh reinforcements. Electricity, light, heat, air, and water are continually working for us in a way incomprehensible, but always by fixed laws, the observance of which laws when known tends vastly to our advantage. As I have said, organic matter must be always at command in the soil, and there is no better way of supplying this organic matter than by mixing peat with *animal manures*. These manures not only tend to modify the mechanical texture of the soil, but they furnish carbonic acid and ammonia, or nitric acid, and the earthy and saline compounds required by plants. They assist in the decomposition of the vegetable matter, while the absorbing peat seizes and retains all their most volatile parts, one-half or two-thirds of which might otherwise escape. It has been estimated that one cord of animal manure, properly composted with peat, will make four times its original value in good manure.

As ammonia is the natural food of plants, the best manure is that which will produce and retain the greatest amount of nitrogen, which is the base and principal ingredient of ammonia. If nitrogen

is furnished in the solids, the atmosphere will supply the hydrogen needed to form the ammonia. Hence, the amount of nitrogen it can furnish, mostly determines the value of a manure. Prof. Johnston is of the opinion that ammonia is supplied to plants by the natural decay of animal and vegetable substances; and that nitric acid is formed partly by the oxidation of *dead* organic matter, and partly by the union of oxygen and nitrogen through the electricity in the air.

Nitrogen, however, is the great operator and food provider of plants. The ammonia produced by it and its power to form nitrates are invaluable. Nitrates in which the nitrogen exists as an acid are great workers in the decomposition and decay of organic matter, either in the compost heap or in the soil. But salts alone, without the addition of nitrogenous matter, will not long avail. Neither will carbonic acid or ammonia alone be sufficient. Organic matter is essential to success. Extremes of all kinds are to be avoided, and every factor must work without violence, *in due time*, within proper limits, and with plenty of liquid. A good manure is that which will furnish the necessary ammonia when wanted, or which, by its combinations, can be easily converted into ammonia. The humus of peat is continually decaying, and is thus continually forming carbonic acid; it is also taking up nitrogen from the air and converting it into nitric acid and ammonia. It gives warmth and porosity to the soil, and supplies it with soluble materials; while the insoluble earths are consumed by the acids, and thereby adapted to vegetation. Nitrates, and other salts (without animal manures), must not be applied repeatedly to the same land. In the absence of alkalies, no vegetable fibrine or vegetable caseine can be formed. Alkalies, with animal manures, have the power to form nitrates and become very effective. Peat has the power to form alkalies, and this power is of great service.

Dr. Dana says, that one cord of fresh peat will neutralize one hundred pounds of soda-ash; and that one cord of barnyard manure will decompose from three to six cords of peat. One dead horse, well covered with peat, will convert fifteen or twenty tons of peat into a manure equal to the average from the stable; for it will separate nearly all its nitrogen from the other constituents, and hold it in the heap. He thinks, also, that the salts contained in one cord of peat are equal to the droppings of a cow for three months, and, by analysis, they are found to have the same chemi-

cal qualities, excepting that there is less activity and odor in the peat. The late Mr. Phinney, of Lexington, declared that if two cords of peat were mixed with one cord of cow manure, the mixture was fully equal to three cords of fresh cow manure.

The weight of authority seems to indicate that one ton of manure from the barn, will decompose from three to six tons of muck, but it is better to use a larger proportion of animal manure. Complaints have sometimes been made that the use of peat and muck produced sour and meadow grasses. But if so, they must have come from applying the peat before it was properly ripened and sweetened by age and decomposition, without which little effect is seen.

Peat must be used discreetly, and the following hints may not be inappropriate:

1st. As a rule, peat should be dug several months before it is taken to the barn or compost heap. The weight to be carried will then be lighter and its absorbent qualities greater.

2d. The old rule, of keeping the compost through two summers and one winter (or for two years) before use, stands good today, where the best economy is exhibited. Time — a long time — is essential to its decomposition and it should not be used until decomposed.

3d. If possible, protect occasionally the compost by rough boards, from excessive flooding by rains. And if peat is placed under the barn, let it be two feet thick and so placed as to catch all the liquids from the stalls, such liquids being one-sixth part more valuable than the solids. Add any waste vegetable matter, as often as may be, and see that the drainage from the stable does not rob the compost.

4th. Fermentation must be encouraged, but the pile must not become fire-fanged or overheated. When found to be at blood heat, turn it over or water it.

Few persons realize that in the decay of animal or vegetable matter the same amount of heat is thrown out as there would be if the same matter was consumed by fire; and the heat is just in proportion to the rapidity of the decay. In warm weather, a compost heap may become heated in ten or fifteen days. It is well, therefore, to lay a few sticks into the heart of it, which can be withdrawn and the heat tested, as occasion may require.

More than a century ago, Lord Meadowbank gave directions as

to the best mode of making a compost bed of peat, some of which are not now inapplicable. Availing myself of some of his suggestions, I will take the responsibility of here giving my own.

If a large bed is to be formed, select a convenient spot, nearly level, and mark out a parallelogram, about twelve feet wide, and of any desirable length, for the ground to be occupied. Cover this bed over with peat, which has been dug several months, to the depth of ten inches; then dump successive piles of barn manure in a line close up to the sides of the peat, sufficient to cover it to the depth of six inches, to be shovelled in. Protect the exposed sides, as filled up, and dump along them enough more peat to raise the bed about eight inches more, and shovel it evenly over the manure; then, in like manner, add about four or five inches of manure, and so on, adding peat and manure in alternate layers until the pile is about four feet high; the last or top layer always to be peat and the sides protected by it, and the upper layers being thinner than the lower.

After fermentation has commenced, see that the heat is not too great; and when necessary, begin at one end, and facing that way, throw the material, well mixed, toward that end, operating straight across the heap and to the very bottom, smoothing and securing the sides as the work goes on. Do this as often as any vapor with the odor of ammonia or manure is perceived. Sticks may be placed in the pile to test the heat, as already suggested. Rain storms are sometimes long-continued and severe, and it would be well to have a partial covering of rough boards in readiness for occasional protection from a flood.

If only a small quantity of manure is used, the heap may be one or two years in the process of decomposition; but if a large amount of manure or salts is employed, the process may be hastened. Any waste vegetable or animal matter, kelp, bone-dust, or a small sprinkling of slaked lime may be intermixed with profit. If animal manure is wanting, fifteen or sixteen bushels of leached wood ashes to a cord of peat will excite fermentation. Sixty pounds of soda-ash or ninety pounds of potash, dissolved and evenly distributed in a liquid state, will decompose a cord, but earth or peat should always be at the top of the compost, to arrest any liberated gases.

Dr. Jackson, after recommending the mixing with lime or ashes, as tending to disengage the ammonia, saturate the noxious acids, and convert them, by combination, into fertilizing salts—adds this cau-

tion—"but *too much* lime applied to a heap may cause a burning of the material and make it but little better than charcoal."

If lime is used at all, it should be applied in such moderate quantities that its mixture with fresh peat will generate a degree of heat so slight as not to prevent the absorption of the fertilizing acids and gases generated in the pile. But it is safer and better in all cases to employ the alkaline salts instead of lime.

To conclude: Peat, decomposed with animal manures, is undoubtedly an admirable manure; especially for high lands, or sandy, gravelly, or loamy soils. In fact, it is good on any soil.

It is valuable, as a *great absorber* of water and gases:

It is valuable, as a *great retainer and feeder* of these:

It is valuable, as a *constant collector and renewer* of supplies, and as a *great assimilator* of plant food.

For fruit trees and grass, it is exceedingly efficacious.

If it is objected that its black color attracts heat to such an extent as to burn the grass over which it is spread, we may reply, "if it heats more quickly, so it cools more quickly;" and if in hot weather it becomes quickly heated at mid-day, so it cools quickly towards evening and will for an hour or two longer than otherwise, bring down and hold the refreshing dews of the season. Its humus, by constant decay, keeps up a needful aid, and the naturally inert material, by proper admixture, becomes an efficient power. The old saying may still be true, "Muck makes the meal-chest."

Discussion.

The Chairman said that this most suggestive essay opened up another phase of the fertilizer question, which had been discussed here this winter, and called on members present to give their views on the subject.

Benjamin P. Ware said that he had had a good deal of experience with meadow muck, and the opinions which he had formed varied much from those of some others of equal experience. This appeared very strange, and he could account for this difference only on the supposition of a difference in the quality of the muck. He thought the subject had been fairly presented, and the views of the essayist were very much in accordance with his own. He lives on the sea-shore and obtains much manure from the sea—mainly kelp.

This heats and decomposes very rapidly, and is excellent for composting with muck. Success depends very much on the amount of fermentation which can be produced in the heap. He preferred to dig the muck two or three years before using, as the winter frosts decompose it faster than any other agency, and the rains assist. He digs out a large quantity in August, and removes it to the site of the compost heap in winter when the meadow is frozen so that it will bear teams. He thought that a mixture of two-thirds muck and one-third kelp, was as good as entire sea manure. Horse manure, or anything that will produce fermentation, is good for mixing with the muck. Fish pomace is admirable. He did not think it needful to cover the compost heap from the rain. His brother hired the Pickman farm in Salem (a milk farm with a large stock of cattle), when it yielded seventy-five tons of hay. By the use of muck, composted as described, in addition to the dung of the cattle, in three years he brought the produce of the farm up to two hundred and twenty-five tons.

The speaker had used muck all his life, and felt much interest in the subject of the essay. He formed his compost heaps very much as described by the essayist. The heap should be forked over frequently, as every stirring produces a new fermentation. A mixture of lime and salt may be used in the compost heap and add to its fertilizing qualities. While some muck has very little value, that which is valuable is inert until decomposed. Green hide is not leather, but becomes leather when tannin is chemically united with it. So meadow muck in a cold, inert condition is not manure—not a fertilizer—but let it be fermented and it becomes one of the most valuable fertilizers.

The Chairman regretted that some of the vegetable growers, who were present at the opening of the meeting had left, as he would have liked to hear their views. He believed that generally they prefer unadulterated fertilizers, like the strongest stable manure, to muck compost. He agreed with Mr. Ware that there is very little value in meadow mud just taken out. This was shown in an old orchard which the speaker had lately removed, where a quantity of meadow mud was placed under each tree. It had remained unchanged for forty years, and the roots avoided it as if it were poison. It should lie two or three years after being dug and be subjected to fermentation. The general experience of cultivators

does not corroborate Dr. Dana's theory as to the use of salts in curing mud.

Mr. Fuller thought that it would not do to use the salts exclusively or without barnyard manure. He agreed with Mr. Ware that time is the great curer of muck.

B. G. Smith had derived great advantage from the use of muck in his garden. Some years ago he had one hundred and fifty cartloads brought in, which laid exposed to the atmosphere. Before composting he mixed it with lime to sweeten it, using on three or four cords a barrel of lime, slaked with water in which half a bushel of salt had been dissolved. He then composted one-third of barnyard manure with two-thirds of muck, letting it lay two or three years, and turning it over two or three times.

Henry Ross had used several hundred cords of muck and had not been so successful as the previous speakers, but perhaps he had not used brains enough. Any one who crosses a swamp, and notices the luxuriant growth of trees and herbage, among which pine stumps four feet in diameter may sometimes be seen, must be convinced that it contains vast quantities of plant food. As superintendent of the Newton Cemetery, he had had occasion to grade two or three acres of lawn at a time, in a sandy soil. He had dug out large quantities of muck, and, after grading, spread it on three or four inches in thickness, digging it into the subsoil and replacing the loam over it. He then manured highly and sodded or sowed his grass seed, and found that, applied in this way, the muck was of great benefit in retaining moisture. It is also useful as an absorbent of fertilizing gases. It holds frost so late as to be objectionable as a top-dressing. He intended to use a compost of bone-dust and muck side by side with the Stockbridge fertilizer the coming season. He did not like to use barnyard manure as a top-dressing, on account of its disfiguring the lawn.

Mr. Ware advised Mr. Ross to mix fish pomace with his meadow mud and bone, but Mr. Ross replied that the odor from fish would be objectionable in the cemetery.

Mr. Fuller said that he was acquainted with the location of Mr. Ross' land and peat deposits, and that there was a stream running through, which might drain the virtue out of the muck. If the muck was taken from such a deposit, he should not expect any advantage from it. Muck is of little or no benefit, when ploughed in before it is decomposed. He agreed with Mr. Ware that ordinary

rains would not injure a compost heap, but it should be guarded from excess of rain. The roof over it should not be tight, but may be of loose boards, as the compost will not ferment without some moisture.

Mr. Ross said that the muck which he used was not taken from the place referred to by Mr. Fuller as having a stream running through it, but from another deposit not liable to that objection. The quality of the latter was such that manufacturers of poudrette chose it in preference to any other. While his compost heap is decomposing he throws brush over it to keep off the sun. He was still of the opinion that the best use of muck is as a retainer of moisture, and as an absorbent of ammonia and other fertilizing gases, but he had learned a good deal from what had been said today. In answer to an inquiry Mr. Ross said that the grass roots extend down to the layer of muck which he places under the top soil, but do not enter it.

Mr. Smith thought that if muck is of little or no use, as is the opinion of some, many people in Cambridge are much benighted.

Mrs. C. N. S. Horner said that while the value of peat as a fuel and as a fertilizer had been mentioned, one important use had been omitted, viz.: as a deodorizer. As an absorbent around sink drains, etc., it produced a wonderful effect in deodorizing them.

M. H. Merriam said that his first experiment in the use of peat was by digging it and exposing it to the frosts of a single winter, which rendered it light and friable. Once a week he carted into the barnyard three times the amount of the droppings. Early in spring it was carted out and applied to fodder corn and potatoes. The growth of both, early in the season, was remarkable, and the corn being cut early needed nothing more, but the potatoes suffered more from drought than those where other manure was used. Perhaps the muck was not sufficiently decomposed. In another experiment sods and similar materials were laid on brush, so as to form a free drainage, and muck placed on top. Liquid manure was then poured over the whole, and produced a very rapid fermentation, decomposing even potato stalks. His most successful experiment with muck was in composting it with the refuse of animal skins boiled down to a glue. When this was incorporated with the muck, fermentation soon commenced and produced a fertilizer which he had never seen equalled in its effect on grass fields. The place where it was applied could be distinguished all through the season,

and though this was five or six years ago, the effect is still perceptible. The glue was thoroughly incorporated with the muck while in a liquid state, and applied at the rate of twelve hundred pounds of dry refuse to the acre.

James Cruickshanks remarked that the muck generally used here is very different from that which he knew in Scotland. Most of it there can be cut out in bricks. At Woodlawn Cemetery, in making an avenue through a swamp, he dug out a large quantity of peat, which he began to use after it had lain two years, and continued to use for eight or ten years. Having occasion to plant a hedge of arbor vitæ, which is a swamp plant, he dug a trench eighteen inches wide and the same in depth, and filled in six inches of muck in the bottom, and on this placed six inches of soil. He then set the plants and gave them a thorough watering, and in forty rods of hedge he did not lose more than five plants. He thought the muck useful in retaining moisture.

Mr. Fuller said that lime must be used only in moderate quantities in connection with peat. If used too largely the peat will be charred. He thought that a sprinkling of lime on the successive layers — just enough to cover each layer of the compost heap — would be sufficient. In answer to an inquiry, Mr. Fuller stated that quick lime may, by its action, discharge valuable gases. He used last spring 2,200 bushels of ashes, which was procured from lime-kilns in Maine, and, though largely mixed with lumps of lime and other rough material, it produced a good effect as a top-dressing on a sandy soil.

Marshall P. Wilder said that the remarks which had been made had established several principles in regard to the use of peat. It should be taken out in a dry time, and allowed to drain, saving expense in carting; it should lie a year or two before composting, and it should be thoroughly decomposed. He was very glad to hear from Mrs. Horner in regard to its deodorizing properties, which he attributed to its carbonaceous composition. When properly matured by age it is one of the purest of soils. By a pure soil he meant one entirely free from manure. Certain plants are cultivated in a mixture of peat and sand alone, and in such cases the growth is largely due to proper watering. He had two farms, and bought a meadow for the peat which it contained, and which he found most useful as a fertilizer, but only when old. Many years ago he recommended a cord of peat, mixed with six bushels

of unleached wood ashes and a bushel of bone-dust, as an excellent fertilizer for fruit trees.

Now that the meetings for discussion were about to close for the season, Mr. Wilder wished to say that he had been much interested in them, and believed that they had been very advantageous to all who had attended. He referred to the Chairman of the Committee on Publication and Discussion, who presided on this occasion, as the projector of these meetings, and as having done more than any one else to sustain them, and expressed the conviction that he had never done the Society a more beneficial service. No lady or gentleman could come in to one of these meetings without gaining some information, even on the most common subjects.

N. B. White said that peat was always found in low places, and that it is very expensive to get it up on high land. If the meadow is so situated that it can be drained and cultivated, he believed that that course would be found more profitable than digging and composting the peat. He thought, also, that poor or exhausted soils could be brought to a state of fertility at much less expense by ploughing in green crops, than by fertilizing with peat compost, which requires so great an amount of labor.

The Chairman said that, though many of the best cultivators do not use a great amount of peat, he thought all would agree as to its value as an absorbent and in handling manure.

Rev. A. B. Muzzey, of the Committee on Publication and Discussion, remarked that we have in the Society abundance of material for very interesting essays, and suggested that during the interim the members should be maturing papers to be read when the meetings are resumed another season, which would be a great assistance to the Committee.

The Chairman then announced that the meetings for discussion were closed for the season.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1878.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1879.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

Saturday, April 6, 1878.

A duly notified stated meeting was holden at 11 o'clock, President Gray in the chair.

The President announced that the Flower Committee had organized by the choice of William H. Spooner as Chairman.

On recommendation of the Executive Committee, William Bull, of Chelsea, England, and Isidor Bush, of Bushberg, Missouri, were chosen Corresponding Members of the Society.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society appropriate three hundred dollars to meet the expenses of the Committee of Arrangements for the current year, and one thousand dollars to the Committee on Publication, for the publication of the History of the Society. These appropriations were voted on separately, and were unanimously passed.

On motion of Marshall P. Wilder, the subject of the celebration of the Fiftieth Anniversary of the Society was referred to the Executive Committee, with full powers.

Marshall P. Wilder, in some appropriate remarks, announced the death of Hon. Willard C. Flagg, of Moro, Illinois, a Corresponding Member of the Society, and moved the appointment of a committee to prepare memorial resolutions. The Chair appointed Marshall P. Wilder, Charles M. Hovey, and Robert Manning, as that Committee.

Adjourned to Saturday, May 4.

BUSINESS MEETING.

SATURDAY, May 4, 1878.

An adjourned meeting of the Society was holden at 11 o'clock. The President and Vice-Presidents being absent, Marshall P. Wilder was chosen President *pro tem.*

The following named persons having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

J. ARTHUR BEEBE, of Boston,
WILLIAM H. BOWKER, of Boston.

The President *pro tem.*, as Chairman of the Committee to prepare resolutions in memory of Hon. Willard C. Flagg, reported the following:

Resolved, That in the decease of Hon. Willard Cutting Flagg, a Corresponding Member of this Society, we recognize and mourn the loss which we, in common with the public, and especially the agricultural and horticultural community, have sustained, of one of its ablest and most eminent workers and writers. Mr. Flagg held at various times the positions of Secretary and President of the Illinois Horticultural Society; was Corresponding Secretary of the Illinois Industrial University from its foundation to his decease, and, at the time of his decease, was Secretary of the American Pomological Society, President of the National Agricultural Congress, President of the Illinois Farmers' Association, and one of the chief editors of the American Encyclopædia of Agriculture. He was also a trustee at various times of several State institutions, including the Illinois Industrial University, and was, for several years, a Senator in the Legislature of Illinois. But, while recognizing his eminence, as shown by the many offices which he has been called to hold, and in which it will be difficult to fill his vacant place, we would especially remember his enterprise, his thoroughness in all that he undertook, his spotless character, in public as well as in private, and the universal esteem in which he was held for his probity, social qualities, and high culture. We would remember him as a man of strict honor and integrity, who loved justice for the sake of justice, and whom none could swerve from the path of duty.

Resolved, That these resolutions be entered on our records, and

that a copy be transmitted to the widow of Mr. Flagg, with the assurance of our warmest sympathy with her in her sad bereavement.

Robert Manning said that he became acquainted with Mr. Flagg at the meeting of the American Pomological Society, at St. Louis, Missouri, in 1867, and recognized him as a man of natural intelligence, trained by education, and especially desirous to do fully and thoroughly whatever he did; and that further acquaintance with him, personally and by correspondence, had continually deepened this first impression, and he regarded his loss as a national calamity.

Benjamin G. Smith said that he was greatly impressed by Mr. Flagg's energy and force of character, and his strong personal magnetism. He regarded him as one of the most valuable men in the horticultural world, and the longer his acquaintance, the more his esteem for Mr. Flagg increased.

The Chairman of the meeting said that while the death of Mr. Flagg was a severe loss to the horticultural world, it came nearer home to him as President of the American Pomological Society, for, as Secretary, Mr. Flagg was his right hand man. To energy and despatch in business, he united thoroughness, in rare combination. Though naturally strong and healthy, he was carried down to the grave by the weight of his labors as agriculturist, horticulturist, and statesman.

The resolutions were unanimously passed.

The President *pro tem.* announced the decease, since the last meeting of the Society, of one of its founders and original corporators and its first Treasurer, Cheever Newhall. On motion of A. D. Capen, the Chairman of the meeting, C. O. Whitmore, and P. B. Hovey, were appointed a committee to present resolutions in memory of Mr. Newhall.

The Chairman, as President of the American Pomological Society, presented copies of the Proceedings of that Society.

Adjourned to Saturday, June 1.

BUSINESS MEETING.

SATURDAY, June 1, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President C. H. B. BRECK in the chair.

CHARLES E. RIDLER, of Kingston, and
Miss KATIE A. HILL, of Lowell,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Marshall P. Wilder, Chairman of the Committee to prepare resolutions in memory of Cheever Newhall, presented the subjoined, remarking that, probably from his great age, it had been his lot oftener than he could wish to offer such resolutions, and that he did it in conformity to his views of duty to those who had gone before us. He eulogized Mr. Newhall as a man, a horticulturist, and a farmer, and added that, since his decease, the only survivor of the eight gentlemen named in the charter of the Society is John B. Russell, now of Newmarket, N. J.

Resolved, That in the death of Cheever Newhall this Society has lost one of its oldest and most valued members, — one whose name appears in its act of incorporation, passed almost fifty years ago, — and a true and constant friend of our association.

Resolved, That in the valuable services rendered by him we recognize the faithful discharge of official duty as the first Treasurer of the Society; as Vice President for seventeen years, and as a liberal patron of agriculture, horticulture, and rural improvement.

Resolved, That while we sympathize with his bereaved widow and relatives in this affliction, we desire to recognize the Divine Goodness which gave to Mr. Newhall and to the Society such a long and useful life, which will ever be commemorated by the excellent portrait that now adorns our walls.

Resolved, That these proceedings be entered on our records, and that a copy be transmitted to Mrs. Newhall.

Gen. Josiah Newhall seconded the resolutions, and said that Cheever Newhall had for fifty years been one of his dearest friends. He was a descendant of Thomas Newhall, who settled in Lynn in 1630. He was one of the best informed and most successful prac-

tical farmers in Norfolk County; and one of the founders, and, for a long course of years, a Vice President, of the Norfolk Agricultural Society. He was President of the Massachusetts Agricultural Club from its formation to his decease, and was a member of the United States Agricultural Society. As a merchant, he was distinguished for uprightness and integrity, and was always faithful in every sphere of duty.

Vice President Breck said that in 1839, when a boy, he became acquainted with Mr. Newhall. They met in the office of the "New England Farmer," to which paper Mr. Newhall was a frequent contributor. He thought that Mr. Newhall had done as much as any one in New England for the promotion of agriculture. He was highly esteemed as a man, and as a merchant was upright in all his acts.

Aaron Davis Capen said that Mr. Newhall had resided in Dorchester for at least fifty years, and that he had known him all that time. He knew him well, and knew well of him. Those employed by him bore testimony to his worth. Mr. Capen had rarely heard a man so highly spoken of by those who worked for him. They never received a harsh word or unkind treatment from him.

The resolutions were unanimously passed, and the meeting was then dissolved.

BUSINESS MEETING.

Saturday, July 6, 1878.

A duly notified stated meeting of the Society was holden at 11 o'clock, Vice President C. H. B. Breck in the chair.

The only business was the announcement of the reception by the Secretary, of letters from Mrs. Willard C. Flagg, and Mrs. Cheever Newhall, acknowledging the receipt of the resolutions passed by the Society in memory of Mr. Flagg and Mr. Newhall.

Adjourned to Saturday, August 3.

BUSINESS MEETING.

Saturday, August 3, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, President Gray in the chair.

The Secretary presented a communication from the United States Commissioner of Agriculture, inquiring as to the cause of the grape rot. On motion it was voted that the communication be referred to the Fruit Committee.

Agreeably to the Constitution and By-Laws, the President appointed the following named members a Committee to nominate suitable candidates for the various offices of the Society for the ensuing year: C. O. Whitmore, W. C. Strong, C. H. B. Breck, C. N. Brackett, J. D. W. French, A. B. Muzzey, and E. W. Wood.

Alexander Anderson, of Hingham,

having been recommended by the Executive Committee, was, on ballot, duly elected a Life Member of the Society.

Adjourned to Saturday, September 7.

BUSINESS MEETING.

Saturday, September 7, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President C. O. Whitmore in the chair.

The Chairman presented the report of the Nominating Committee, which was read by the Secretary.

Marshall P. Wilder announced the decease, since the last meeting, of William R. Austin, long an officer of the Society, and an experienced cultivator, and moved that a committee of three be appointed to prepare memorial resolutions. The Chair appointed as that Committee, Charles M. Hovey, Marshall P. Wilder, and William C. Strong.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 5, 1878.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, President GRAY in the chair.

Notice of the meeting having been given in accordance with the Constitution and By-Laws, the polls for the election of officers and committees were opened at five minutes past eleven. The President appointed E. W. Buswell, John G. Barker, and John C. Hovey, a Committee to receive, assort, and count the votes given, and report the number.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

ROBERT PETREMANT, of Boston Highlands,
AZARIAH ELDRIDGE, of Yarmouthport,
JULIAN O. MASON, of Braintree,
Miss H. N. SANDS, of East Somerville,
ALFRED HENRY HERSEY, of Hingham.

The polls were closed at five minutes past twelve o'clock, and the Committee to count the votes reported the names of the officers and members of committees chosen, who, in accordance with the Constitution and By-Laws, were declared by the President to be elected officers and committees of the Society for the year 1879.

Adjourned to Saturday, November 2.

BUSINESS MEETING.

SATURDAY, November 2, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President JOHN C. HOVEY in the chair.

HENRY C. COOKE, of West Newton, and
JOSEPH S. CHASE, of Malden,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Charles M. Hovey, Chairman of the Committee appointed to prepare resolutions in memory of Captain William R. Austin, presented the following:

The Massachusetts Horticultural Society, having learned with deep regret of the death of their late associate, Captain William R. Austin,

Resolved, That in his decease the Society mourns the loss of one of its most honored and trusted members. As Treasurer for a long series of years, he devoted his leisure time and ability to the welfare and best interests of the Society; as a member of various committees, he neglected no duty; as a horticulturist, he originated the now well known method of training pear trees, so successfully practised by him during his life; and as an exhibitor of choice fruits, his contributions attested his enthusiasm and skill as a cultivator.

Resolved, That we highly appreciate the valuable services rendered by Captain Austin to the Society, as well as his life-long devotion to horticultural pursuits — a rare example of untiring industry, and enduring interest, in all the objects and purposes of our association.

Resolved, That the members of the Society condole with the family of their late associate in their irreparable loss.

Resolved, That these resolutions be entered upon the records of the Society, and that a copy be sent to the family of the deceased.

Mr. Hovey said that it was unnecessary to go into any extended remarks on one so well known as Captain Austin. Besides his interest in fruit culture, as shown by the plan which he originated of training trees in the vase or wine glass form, and which he carried to perfection, producing finer specimens of trees, both on quince and pear roots, than any other cultivator, and by his large contributions to our exhibitions, — aside from all this, we recall his services as Treasurer, commencing in the comparatively early history of the Society, and continuing for many years, during all which time he so managed the financial affairs of the Society as to give entire satisfaction. We remember him as a merchant, citizen, husband, and father, and as exemplary in all these relations. We remember his generous hospitalities, and feel that we are greatly indebted to him, and that our loss is irreparable.

Marshall P. Wilder said that he could not allow this occasion to pass without saying one word as a testimonial of respect and affec-

tion for his deceased friend. His acquaintance with Captain Austin commenced fifty years ago, and from that time he had felt a most sincere regard for him. He was full of enterprise; he gave the most assiduous personal care, when it was possible, to the cultivation of his trees. As Treasurer, he was most careful and accurate, and an example to all who shall follow him; and for his services in that capacity, we owe him many thanks. Mr. Wilder spoke of the services of Captain Austin at the time of the erection of the present Hall of the Society, and of his caution, as shown by his hesitation in signing the report in favor of building. He was a townsman of the speaker, and, as a neighbor, he was unobtrusive, kind, and genial.

Vice President Hovey spoke of Captain Austin's services as Chairman of the Committee on Gardens, in which position he knew him best, and said that all would remember him as one who had done as much for the Society in that direction as any other member.

The resolutions were unanimously passed, and the Society adjourned to Saturday, November 16.

BUSINESS MEETING.

SATURDAY, November 16, 1878.

A meeting of the Society was holden to-day at 11 o'clock, agreeably to adjournment, Vice President C. O. WHITMORE in the chair.

The Executive Committee recommended the following appropriations for the year 1879:

For Prizes, ...	$3,050 00
For the Library Committee, . . .	200 00
For the Committee on Publication and Discussion,	150 00

Agreeably to the Constitution and By-Laws these recommendations were laid over until the first Saturday in January.

Adjourned to Saturday, December 7.

BUSINESS MEETING.

SATURDAY, December 7, 1878.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President C. O. WHITMORE in the chair.

W. C. Strong, Chairman of the Committee on Publication and Discussion, read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication. Mr. Strong, also, in reply to an inquiry, stated the plans of the Committee in regard to meetings for discussion during the coming season.

Mrs. H. L. T. Wolcott, Secretary of the Special Committee on Window Gardening, read the Report of that Committee, which was accepted and referred to the Committee on Publication.

On motion of W. C. Strong it was *Voted*, That the thanks of the Society be presented to Mrs. E. Tisdale Talbot, Rev. Rufus Ellis, Rev. George J. Prescott, and the other ladies and gentlemen who have co-operated with the Society in the promotion of Window Gardening, for the care with which they have endeavored to interest the children in Boston and vicinity, in the culture of plants.

Joseph H. Woodford, Chairman of the Committee on Gardens, read the Annual Report of that Committee.

Waldo O. Ross, Chairman of the Library Committee, read the Annual Report of that Committee.

William H. Spooner, Chairman of the Committee on Plants and Flowers, read the Annual Report of that Committee.

Charles N. Brackett, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

The Chairman of the meeting reported from the Executive Committee the list of Prizes to be offered for the year 1879, with the approval of that Committee. Also, from the same Committee, a recommendation that the Society appropriate three hundred dollars for the expenses of the Committee of Arrangements for the year 1879.

Letters were presented from Waldo O. Ross, Charles S. Sargent, and Daniel T. Curtis, declining the positions on the Committee of

Arrangements, Committee on Gardens, and Committee on Vegetables, to which they had respectively been elected.

Voted, That a committee of three be appointed to nominate candidates to fill the vacancies in the committees for the year 1879, caused by these declinations. The Chair appointed as that Committee, C. M. Hovey, James Comley, and C. N. Brackett.

Voted, That the reading of the Report of the Committee on Fruits be postponed for one week.

Adjourned to Saturday, December 14.

BUSINESS MEETING.

SATURDAY, December 14, 1878.

A meeting of the Society was holden to-day, agreeably to adjournment, Vice President C. O. WHITMORE in the chair.

John B. Moore, Chairman of the Committee on Fruits, read the Annual Report of that Committee.

It was moved by N. B. White, and seconded by J. W. Talbot, that the portion of the Report of the Fruit Committee relating to hybrid grapes, be stricken out. After discussion by Messrs. White, Moore, Talbot, J. C. Hovey, B. G. Smith, and James Cruickshanks, the motion was negatived.

The Report of the Fruit Committee was then accepted and referred to the Committee on Publication.

Robert Manning read his Annual Report as Secretary, which was accepted and referred to the Committee on Publication.

The Committee appointed at the last meeting to nominate candidates for the vacancies in the Standing Committees of the Society for the year 1879, made a report which was accepted, and, agreeably thereto, John G. Barker was elected to fill the vacancy in the Committee on Gardens; John Fillebrown was elected to fill the vacancy in the Committee on Vegetables; and E. W. Wood was elected to fill the vacancy in the Committee of Arrangements.

On motion of John B. Moore it was *Voted*, That the Fruit Com-

mittee award the income of the French Fund, to an amount not exceeding thirty dollars per annum, in prizes for apples; and that the number of prizes, time of award, and other details, be at the discretion of the Committee.

Voted, That the subject of baskets for the exhibition of strawberries be referred to the Committee for Establishing Prizes, with full powers.

J. W. Talbot made some interesting remarks on the Influence of the Stock on the Graft, and expressed a desire that the subject should be discussed by the Society. On motion of M. H. Merriam it was *Voted*, That Mr. Talbot be requested to prepare a paper on the subject mentioned by him, to be read at such time as may be fixed by the Committee on Discussion.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1878.

By WILLIAM H. SPOONER, Chairman.

Assuming the duties of his office unexpectedly, and at a time when the work of the year had already commenced, the Chairman of the Flower Committee could hardly hope to bring to the position that careful preparation which alone could enable him to fulfil its requirements; but, while begging your charitable judgment towards his official shortcomings, he need not make the same request with regard to the exhibitions of the past year, which have been unusually good, and several of them much above the average. First among these may be mentioned that of March 2d, with the forced Perpetual Roses, Cyclamens, and Orchids. The Rose Show was particularly noticeable for the increased number of competitors for the larger prizes, although your Committee were disappointed in not seeing more of the new roses introduced in 1875, which was rich in choice varieties and roses of remarkably sweet perfume. The Annual Exhibition was, in many respects, the best ever held by the Society, especially in the collections of fine plants, some of them from parties whom we shall hope to see often hereafter. It is much to be regretted that this exhibition was not more fully appreciated and visited by the public; and we trust the shows of the next season, with the changes proposed in the manner of conducting them, will prove more remunerative to the Society. Many of the smaller weekly shows have been made particularly interesting by contributions of new and rare plants and flowers, which your Committee have endeavored to encourage by suitable recognition.

The display of Cut Flowers, during the whole season, has been unusually good; W. K. Wood has been a constant contributor, taking the first prize every Saturday since June 1st. His stands have been arranged with peculiar taste, and his selections of flowers have been remarkably good; we feel justified in commending such a youthful florist for his successful efforts. Mrs. E. M. Gill has also been a constaut contributor to this department of the exhibitions, furnishing excellent assortments, and displaying good judgment in their arrangement, usually securing the second prize. Good displays have also been made during the season by James O'Brien, W. J. Vass, J. B. Moore, and George Craft.

January 19.

H. H. Hunnewell exhibited a fine plant of *Cœlogyne cristata*, a very beautiful orchid, bearing five or six flowers on a drooping spike, the flowers being about three inches across, and of a pure white color, with a golden blotch on the lip. Its early blooming makes it peculiarly valuable. From James Comley came a novelty for the season in the form of forced Larkspur, particularly well bloomed.

January 26.

Mrs. A. D. Wood presented *Iris cristata*, which appears admirably adapted for forcing for florist's use.

February 23.

J. B. Moore exhibited very fine Hybrid Perpetual Roses, and James Comley a basket of very superior, mostly new, dark colored roses of the same class.

March 2.

Hovey & Co., and C. M. Atkinson, exhibited choice collections of Camellias. Orchids from F. L. Ames, and C. M. Atkinson, were particularly noticeable. C. B. Gardiner again exhibited a large number of plants of his fine improved strain of *Cyclamen Persicum*, though the individual plants were not quite as large as those he presented last year. Mr. Gardiner received the first and second prizes, to which he was justly entitled, although no competitor contested the honors with him. Considering the simple culture required for this popular flower, it seems surprising that there are not more presented at our shows.

Hybrid Perpetual Roses. — For six plants, James Comley was first with Abel Carriere, Jean Liabaud, Mad. Emilie Verdier, Mad. Herivaux, Royal Standard, and Mad. Prosper Langier. J. B. Moore was second with Captain Christy, Alfred Colomb, Mad. Lacharme, Marquise de Castelane, Lyonnaise, and Richard Wallace. In the competition for three plants, J. B. Moore was first with Mad. Baronne de Rothschild, John Hopper, and Mad. Eugénie Verdier. James Comley was second with Rev. J. B. M. Camm, Duchesse de Vallombrosa, and Jean Soupert. For a single plant, J. B. Moore took the first and second prizes with Mad. Baronne de Rothschild, and Marquise de Castellane. For Tender Roses, James Comley was awarded the prize for twelve cut blooms, offering:

Belle Lyonnaise,
Bon Silene,
Catherine Mermet,
Climbing Devoniensis,
Climbing Hermosa,
Gloire de Dijon,
Isabella Sprunt,
Maréchal Niel,
Niphetos,
Pauline Labonté,
Souvenir de la Malmaison,
Triomphe de Rennes.

Mrs. E. M. Gill exhibited a fine stand of Cut Flowers, well arranged, receiving the only prize. Hyacinths from C. M. Atkinson were remarkably good. — choice varieties, and grown with such skill as to receive all the awards in the several sections.

F. L. Ames exhibited from his choice collection:

Cattleya amethystoglossa.
Cœlogyne cristata major,
Cypripedium Sedeni,
Dendrobium Ainsworthii,
Dendrobium crassinode Barberianum,
Dendrobium heterocarpum,
Dendrochilum glumaceum.
Epidendrum macrochilum album,
Epidendrum macrochilum roseum,
Lælia flava,
Lycaste Skinneri,
Saccolabium curvifolium.

The *Dendrobium Ainsworthii* is a new hybrid, imported from England in 1877, and this was probably the first time it has flowered in the United States.

March 9.

Marshall P. Wilder exhibited a very large plant of azalea Exquisita, fully bloomed, measuring six feet in height and fifteen and a half feet in circumference.

March 16.

James Cartwright sent a well flowered plant of *Dendrobium Wardianum*, said to be the finest Dendrobe in cultivation. It is described as a native of Assam; flowers usually in pairs; sepals and petals white and waxy, tipped with magenta; lip, rich orange. James Comley presented a fine plant of Mad. Baronne de Rothschild rose, grafted upon the Dog Rose.

March 23.

F. L. Ames exhibited a plant of *Dendrobium Falconeri*, a species seldom seen in collections of orchids, and very difficult of cultivation; the plant, though not fully in bloom, was sufficiently so to indicate its great beauty. Also, a fine plant of *Odontoglossum Rossii major*, a desirable orchid from Mexico; the specimen shown was small, but well in flower, evincing skill in cultivation. From James Comley came a small collection of choice roses, among which was especially noticeable the fine new Hybrid Perpetual, Miss Hassard, of delicate pinkish flesh color, large and fine form, uncommonly fragrant, and said to be a free autumnal bloomer.

March 30.

We had from Hovey & Co., rhododendron Countess of Derby, of the Sikkim type; flowers very large, pure white; also, seedling azaleas, promising well. From W. E. Endicott, *Oxalis odorata*, a very pretty variety, of the tuberous rooted type, suited to garden or house culture, blooming throughout the season; color, light lavender.

AZALEA EXHIBITION.

April 6.

Although the number of contributors was not large, the plants shown were particularly good, Marshall P. Wilder, and J. B. Moore, being the principal exhibitors. Col. Wilder's plants were very well bloomed, and several of them well trained. He was the only exhibitor of six named varieties, and was awarded the prize for the following sorts: Fair Ellen, Wilderi, President Édouard de Ghellinck, Variegata, Watsonii, and Criterion. From John B. Moore came some excellent plants in good varieties, well

grown and flowered, although they were not of very large size. For the best six varieties in ten-inch pots, Mr. Moore was first with Superba, Hermann Siedel, Marie Vervaene, Mrs. Turner, L'Éclatant, and François de Vos. Marshall P. Wilder was second with Model, Prince Albert, Decora, Bijou de Paris, Mad. Verschaffelt, and Countess of Beaufort. The question was presented to the Committee whether the last mentioned collection should be ruled out, for the reason that one pot measured ten and three-quarters inches, while in Mr. Moore's collection were two pots measuring ten and one-quarter inches in diameter; the latter were of English manufacture with very thick rims, which increased the width, although undoubtedly made for ten inch pots; but as these were the only collections competing for the prize, the Committee unanimously voted to retain them, and the award was made as above. Exhibitors should bear in mind the rules of the Society in regard to the size of pots in which plants are to be exhibited, as in cases of close competition the Committee must rule out all violating the conditions of the Schedule. The competitors for the prizes for single specimens were J. B. Moore, Marshall P. Wilder, and Hovey & Co., but none of the plants offered were deemed worthy of the first prize. J. B. Moore was awarded the second prize for Decorator, exhibiting, also, in collection, Todmani, Flag of Truce, Stella, Extranei, Juliana, Jean Verschaffelt, Acme, and Mlle. Marie Lefebvre.

Fine Pansies came from James Cartwright, and J. B. Moore; and from Edward Butler an admirable plant of *Cypripedium barbatum grandiflorum*. From George E. Davenport, *Pyxidanthera barbulata*, found in the pine barrens of New Jersey, "a charming little prostrate and creeping evergreen; the rose-colored buds are as pretty, nestling among the copious foliage, as the fully expanded white flowers."

April 27.

James Cartwright exhibited *Dendrobium Parishii* and *Phaius Wallichii;* these are choice species, and the plants were grown with Mr. Cartwright's usual skill. From George E. Davenport came rare early native plants.

May 4.

The Pelargonium show was a complete failure. In view of the very liberal premiums offered by the Society for this class of plants,

it seems remarkable that no competitors should have appeared, although ten days of extreme dampness, followed by two of excessive heat, just before the date of the exhibition, undoubtedly destroyed the beauty of the plants. John Parker presented a remarkably well-grown plant of tricolor pelargonium Peter Grieve, grown in a dwelling-house; an admirable example of successful cultivation. Mr. Parker gives his method of culture as follows:

"The plant exhibited was grown in my dining-room at a south window; I have had it three years. In the summer it was plunged in the garden, and when taken up in the fall was cut back severely and re-potted, the old earth being completely shaken out from the roots. After January, it was enriched once a fortnight with weak liquid manure. I use about a pint of hen droppings, which I first scald with boiling water (to destroy any germs of animal life that may exist in it), and then add about two gallons of water*; I wait for it to settle, and do not use the sediment. Once a week I wash my plants thoroughly by dashing water upon them in the open air, if the weather is mild enough. I also wash the pots as often as once a fortnight, and stir the surface of the earth with a fork. If you would have brilliant tri-colored pelargoniums, keep them near the glass, in the full blaze of the sun, from January to May."

Calceolarias, and Herbaceous Plants, were not shown for prizes, and it is the unanimous opinion of your Committee that it would be better hereafter to fix the exhibition of the latter plants two or three weeks later in the season. From Norton Brothers came seven large and well-grown plants of hydrangea Thomas Hogg. James Cartwright exhibited *Cypripedium hirsutissimum* and *Dendrobium Devonianum*, the latter a very free bloomer and valuable for cut flowers.

May 25.

J. S. Richards brought a good collection of late single and double Tulips, also, some very fine seedling Pansies. From Joseph Tailby there was *Dendrobium chrysotoxum*, a fine orchid, growing about a foot and a half high, throwing up its flower scape from near the top of its stem; color, a light yellow, changing to a darker shade. It is somewhat surprising that Mr. Tailby received this plant from abroad only three days previous to the exhibition, its remarkably

* The Committee consider this a *very powerful* liquid manure, and would advise great caution in its use.

fresh and healthy condition, and fine preservation of bloom, attesting the skill of the shippers, Messrs. Veitch, of Chelsea, England, in the packing of plants. It is gratifying to notice the increased attention of our commercial cultivators to the rarer and more delicate species of plants. Prof. C. E. Hamlin, of Waterville, Maine, sent, by J. W. Merrill, a beautiful specimen of that rare plant, *Calypso borealis*.

May 18 and 25.

F. B. Hayes exhibited beautiful collections of Rhododendrons, many of them new varieties.

June 1.

Marshall P. Wilder was the only competitor for the premiums for Tree Pæonies, and received the first prize for some very large flowers, among them Louis Van Houtte and Louis Mouchelet, the former measuring nine inches in diameter; also Lactea, Neumanni, and Purpurea, and seedlings grown by the late Dr. Kirtland. From H. H. Hunnewell came a stand of forty-eight varieties of new and rare Rhododendrons, for which the Society's Silver Medal was awarded. The collection was well worthy the highest of the Hunnewell premiums, but as the giver declines competing for his own special prizes, and as the Society offers but one prize for rhododendrons, and that for a general collection, the Committee were unable to confer a higher award.

Mr. Hunnewell also exhibited the new and beautiful *Azalea mollis*, in several varieties, with much larger flowers than the common Ghent sorts. Hovey & Co., and B. G. Smith, exhibited excellent collections of Hardy Azaleas; from the latter the following varieties: Baron George Pyke, Concinna, Gloire de Belgique, Ne Plus Ultra, Princeps Speciosa, and Punicea. Hovey & Co. showed a single truss of flowers of a remarkably beautiful variety, Superbissima, of flaming orange color.

H. H. Hunnewell sent two new June flowering clematis; Fair Rosamond,—flowers blush white, with a slight tinge of red up the centre of each sepal; and Stella,—light violet, a deep reddish brown in the centre of each sepal, both of them delicately fragrant. Also, *Andromeda Catesbæi*, a rare species. Joseph H. Woodford also sent a beautiful assortment of hardy flowering clematis. John L. De Wolf exhibited a choice collection of seedling Pansies in many

colors—one of the best assortments shown this season. Joseph Tailby showed *Cattleya Mossiæ*, a beautiful free flowering species, about one foot in height, blooming from March to August.

June 8.

F. B. Hayes exhibited very beautiful varieties of Rhododendrons and hardy shrubs, and George E Davenport, *Cypripedium spectabile* and *Hudsonia tomentosa*.

ROSE SHOW.

June 19.

This proved much better than was anticipated from the uncommonly cool weather preceding it, which retarded the roses, and tended to mar their loveliness. President William Gray, Jr., J. B. Moore, John C. Chaffin, J. S. Richards, M. D. Spaulding, and E. W. Wood were the principal exhibitors. The first prize for the best twelve varieties was awarded to John C. Chaffin for

Baron de Bonstettin,	Louis Van Houtte,
Baronne de Rothschild,	Mad. Charles Crapelet,
Captain Christy,	Mad. Victor Verdier,
Charles Lefebvre,	M'lle. Eugénie Verdier,
Countess of Oxford,	Mons. Boncenne,
Étienne Levet,	Paul Neron.

Mr. Chaffin was the only contributor who furnished a list of his roses to the Committee.

President Gray was the only competitor for the premium on varieties sent out since 1875. Moss Roses were not as good as those of previous years. Very fine Maréchal Niel came from several contributors, M. D. Spaulding taking the first prize.

There was no competition for the prizes for Gloxinias.

F. L. Ames exhibited six plants from his superb collection of Orchids, as follows: *Dendrobium McCarthiæ*, *Brassia verrucosa*, *Cypripedium caudatum*, *Cypripedium Dominianum*, *Cypripedium niveum*, and *Thunia Bensoniæ*. The most noticeable of these was *Cypripedium caudatum*. The long, pendant, linear, wavy tails into which the petals are developed, and from which the specific name is derived, are very extraordinary. They are about eighteen

inches in length, and are quite short when the flower begins to open, but grow at the rate of from four to five inches a day. Mr. Ames also showed *Utricularia montana.* Sweet Williams were very good from several contributors. George E. Davenport, E. H. Hitchings, and Mrs. C. N. S. Horner, presented rare native plants. From Curtis, Cobb & Washburn, came six strikingly beautiful varieties of Japanese Maples, viz.: *Acer polymorphum reticulatum* (white), ground very distinct; *A. p. album variegatum*, *A. p. versicolor*, *A. p. sanguineum*, *A. p. roseum marginatum*, and *A. p. dissectum atropurpureum.*

On this occasion, and also on the 22d and 26th of June, J. R. Brewer exhibited *Andromeda speciosa*, a beautiful species bearing racemes of pure white flowers on the upper portion of the stem. The plants were imported by Mr. Brewer about twelve years ago as *A. floribunda*, but proved far superior to that species, and, with him, perfectly hardy.

It would seem that the Rose Exhibition should be made to yield some revenue to the Society, as it can be rendered peculiarly attractive to the public.

STRAWBERRY SHOW.

June 26.

President William Gray, Jr., J. B. Moore, and J. S. Richards, exhibited very fine collections of Hybrid Perpetual Roses. Mr. Moore's were made particularly interesting by being named.

F. L. Ames showed *Lælia majalis*, a grand orchid from Mexico; the specimen was the first ever exhibited in this country; color, beautiful rose, the lip striped and spotted with chocolate. Williams says it is "the finest of the genus, blooming upon the young growth, and lasting five or six weeks in beauty."

Delphiniums were not as good as in some previous seasons; we missed Ex-President Parkman's fine collection. E. H. Hitchings exhibited *Osmunda cinnamomea frondosa*, an unusual form, nearly all the fronds being fertile; also, *Hottonia inflata*, or Water Violet, a singular plant. From J. C. Hovey, Richardson's herbaceous pæonies, Grandiflora, Rubra Superba, and Dorchester—remarkably fine flowers. Miss E. M. Harris presented a most artistically arranged Table Design, composed chiefly of the flowers of native plants.

June 29.

Francis Parkman exhibited a beautiful collection of seedlings from *Iris Kœmpferi* (fibrous rooted); the seed was received by him last season from Baden-Baden. Various shades of color were represented, from pure white to deep purple, light rose, mottled or bizarre, dark maroon, and yellow blotched at the base. These irises are perfectly hardy, and must prove a great acquisition.

July 6.

A. P. Calder presented *Nymphœa odorata* var. *rosea*, very beautiful; color, clear rose or pink; and E. L. Beard, *Odontoglossum cirrhosum*, *Zygopetalum rostratum*, and *Vanda cœrulea*.

July 13.

We had one of the best miscellaneous exhibitions. From J. B. Moore, J. S. Richards, A. McLaren, and J. Nugent, came very fine Hollyhocks; from Messrs. Nugent and Richards, superior Carnations and Picotees; from J. B. Moore, fine Gloxinias, and from J. Tailby a very fine, well grown plant of *Brassia verrucosa*. Also, from E. L. Beard several plants of *Torenia Fournieri*, a very desirable species, almost perpetual blooming. From F. Parkman, a seedling Lily, a cross between *L. longiflorum* and *L. auratum*. The first year of its blooming showed no perceptible change; the plant formed seed very sparingly, but what was produced was sown, and the result is an increased vigor of the plant. The flower partakes largely of the form of *L. longiflorum*, but has the tube swollen; the color of the anthers is changed to a bright orange. Your Committee did not deem the improvement of sufficient importance to merit special commendation, but hope it may lead to a change of color in this beautiful class of lilies.

July 20.

James Comley brought a small plant of a native Maple, with clearly striped foliage, found by him in a swamp near Lexington; if he succeeds in growing the plant, and retaining its remarkable leaf coloring, it will prove a valuable addition to our hardy ornamental foliaged trees. From J. R. Brewer, *Acer Colchicum*, from Japan; probably perfectly hardy; the growing tips of the stems are prettily

bronzed; foliage very striking, resembling that of an English Ivy in form.

Very fine Hollyhocks were shown by J. B. Moore, J. S. Richards, E. Sheppard, and James Nugent; we are glad to note an increasing interest in this showy plant. Your Committee would suggest that hereafter hollyhocks presented for prizes should be shown in rose boxes.

From F. L. Ames, a beautiful plant of *Cattleya Dowiana*, flowers very large, of a nankeen color, the lip being rich velvety purple, streaked with gold. "This is, probably, the most beautiful of the many gorgeous forms which the genus *Cattleya* has produced."

There was no competition for the prizes for Greenhouse Flowers; the third prize was awarded to the only exhibitor.

July 27.

F. B. Hayes sent *Aralia* (*Dimorphanthus*) *Mandshurica*, a new hardy ornamental shrub from Japan, with creamy white flowers; probably perfectly hardy. It is described and figured in the "Gardener's Chronicle," Vol. X. (N. S.), p. 592.

August 3.

The exhibition was not as good as usual; of Balsams, only two stands were shown, and of Stocks only one, neither of which was considered worthy of the first prize. There were but two competitors for the prizes for Annuals and Perennials. Mrs. C. N. S. Horner placed in the stands a very fine collection of native flowers, with their names, which add very greatly to the value of such an exhibition; among them several rare sorts were noticeable, viz.: *Utricularia resupinata*, *U. cornuta*, *Lobelia Dortmanni*, *Lycopodium inundatum*, *Sabbatia chloroides*, and *Asclepias verticillata*. From F. Parkman, one of his excellent seedling phloxes, Mrs. Derby, a remarkably fine variety, of great vigor, with very large flowers, having a rich carmine eye, shading to white at the outer edge of the petals; of very branching habit, bringing out the individual flowers prominently; a very early flowering variety of the autumnal type of phlox.

From Miss S. W. Story, *Lilium Leichtlinii*, of the martagon type, the divisions of the perianth rolling back from near the base;

color, deep bright yellow, profusely spotted with purplish red dots. The plant is apparently of slender growth, from two to three feet high; coming from Japan, it may prove hardy. It was exhibited at the Hall, September 2d, 1876, but does not appear to have been introduced to cultivation extensively. From Miss E. M. Harris, very fine specimens of *Lobelia cardinalis*, both the common and var. *alba*, found on the borders of Stony Brook.

From E. H. Hitchings, the following rare native plants: *Orchis blephariglottis*, *Orchis tridentata*, *Sarracenia purpurea*, *Cornus Canadensis* (ripe fruit and flower), *Sabbatia chloroides* (white and red), *Goodyera repens*, *Cassia chamæcrista*, and *Polygala polygama*.

August 10.

The display of Perennial Phloxes was not equal to that of former years, the extremely wet weather of the previous week having injured the beauty of the flowers. J. B. Moore, and A. McLaren, were the only contributors, the former taking the first prize with the following varieties:

Chimene,	Mad. Langier,
Croix d'Honneur,	Mad. Moissette,
Czarina,	Michel Buchner,
Député Berlet,	Saison Lierval,
Heloise,	Souvenir de Berryer.

The competition for the prizes for Petunias was much larger than usual, George Craft, James Nugent, Mrs. A. D. Wood, and Mrs. W. Latham, contributing fine collections. The Committee were compelled to rule out the first three exhibits, as they each contained one spike more in a single bottle than the Schedule specified, and Mrs. Latham received the only prize awarded.

W. T. Andrews presented a few seedling flowers of the new double, large-flowering, fringed petunia. This was sent out last year by E. Benary, the eminent German seedsman. Mr. Andrews has given his petunia the name of Miss Anna Bigelow. This strain of seed is undoubtedly one of the finest ever presented to the horticultural world; its flowers are very large—Mr. Benary says, "as large as double garden poppies," with all varieties of brilliant color.

August 17.

The display of Gladioli was in most respects very good, although some growers complained that the prize day was a week too early, heavy rains having injured the flowers. Good collections were shown by A. McLaren, J. S. Richards, M. H. Merriam, H. Gleason, and G. Crafts; several fine new French varieties were on the table.

E. L. Beard contributed the following very desirable free-flowering orchids: *Disa grandiflora*, *Odontoglossum Bictonense*, and *Oncidium ornithorhynchum*. Joseph Tailby showed several very fine seedling carnations, grown from seed of La Pureté and Boule de Neige; several of them will undoubtedly prove valuable for florists' use. From Miss E. M. Harris, there was a Table Design composed of native ferns, arranged with her usual excellent taste.

August 24.

Asters were not as well represented as usual, some growers complaining that the prize day was too early, but very good stands were exhibited by E. Sheppard, J. B. Moore, and A. McLaren, who received the three prizes in the order of their names.

T. Putnam Symonds brought a remarkable spike of flowers of *Lilium auratum*, grown upon a stem seven feet high, measuring at the base an inch and a half in diameter, widening at the top to three inches, and consisting of several smaller stems, merged into one broad, flat stem. This bore, when exhibited, one hundred and forty expanded flowers, probably the largest number ever seen in this country or England, on one stem, though the individual flowers were rather smaller than the type. We shall be curious to notice the condition of the plant next season, and to know whether such profuse blooming will kill it, or whether it can continue its wonderful development. This lily has proved very unreliable with most cultivators in this country, blooming for a few years very luxuriantly, and dying suddenly without apparent cause. J. F. C. Hyde sent a seedling gladiolus, pure white, some of the lower divisions striped with pink.

August 31.

Hovey & Co. showed a very fine group of *Lilium Melpomene*. Verbenas were very well exhibited by six competitors, Messrs.

Sheppard, Moore, and McLaren, obtaining the prizes. James Comley showed a seedling verbena, which promises to be a desirable sort; truss, large; color, bright crimson, very dark centre, and a very large eye. From Macey Randall, very good dahlias. Norton Brothers exhibited a collection of excellent asters in pots. There were fine spikes of gladioli from G. Craft, J. Cartwright, and J. S. Richards.

September 7.

The exhibition of Zinnias, if not the best, was probably the largest ever made before the Society. There were seven competitors in the class of twenty flowers, and nine in that of ten flowers, but again the rains of the few previous days had damaged the flowers, many of them being coarse, and hardly up to the standard. J. B. Moore took the highest prize; his flowers were arranged with his usual good taste in the combination of colors. From Hovey & Co., there were two small plants of the new *Coleus multicolor*, "the leaves deeply cut, at the edges undulating; its green color is splashed and spotted with crimson reddish rose, and the young leaves with yellow."

ANNUAL EXHIBITION.

September 17, 18, 19, and 20.

As a whole, this was the best ever made by the Society.

Greenhouse Plants.—The exhibitors of twelve were H. H. Hunnewell, S. R. Payson, William Gray, Jr., and Hovey & Co., Messrs. Hunnewell and Payson taking the first and second prizes. Messrs. Hovey & Co.'s collection was remarkably fine, as was also that of President Gray. Mr. Hunnewell's twelve plants were as follows: —

Alocasia metallica,
" *Veitchii*,
Croton pictum,
Eurya latifolia, var.,
Ficus Parcellii,
Hydrangea speciosa,
Maranta eximia,
" *Makoyana*,
" *pardina*,
Pandanus graminifolius,
Phyllotœnium Lindenii,
Sphœrogyne latifolia.

Great credit is due to Mr. Harris, Mr. Hunnewell's accomplished gardener, for his skill in the grouping of his plants.

Mr. Payson was second with —

Alocasia macrorhiza, var.,	*Dœmonorops fissus*,
" *Sedeni*,	*Dracœna Mooreana*,
Anthurium crystallinum,	*Euterpe edulis*,
Cocos Weddelliana,	*Maranta Veitchii*,
Croton variegatus,	*Pandanus Veitchii*,
Cyanophyllum magnificum,	*Paullinia thalictrifolia.*

Specimen Plant.—The first prize was awarded to President Gray for *Pandanus reflexus*, and the second to Hovey & Co., for *Cycas revoluta.*

Specimen Flowering Plant.—Hovey & Co. took both prizes; the first with *Allamanda Hendersoni*, and the second with *Peristeria elata*, or Dove Flower.

Variegated Leaved Plants.—The first prize was taken by H. H. Hunnewell, with *Croton cornutum*, *C. Johannis*, *C. Mooreanus*, *C. Weismanni*, *Maranta bicolor*, and *Pandanus Veitchii.* The second prize by President Gray, with *Agave schidigera*, *Ananassa sativa var.*, *Croton interruptum*, *Cucurligo variegata*, *Phormium tenax var.*, and *Yucca quadricolor.* Messrs. Hovey & Co. were also competitors in this class with fine plants.

For the best single specimen, not offered in any collection, the first prize was awarded to Hovey & Co., for *Phormium Colensoi.*

Caladiums.—President Gray was first, with finely grown, compact plants of Alfred Bleu, Beethoven, Chantini, Meyerbeer, Triomphe de l'Exposition, and Wightii.

Ferns.—The best six were from J. Warren Merrill, as follows: *Dicksonia Barometz*, *D. Schiedei*, *Gleichenia circinata glauca*, *G. dicarpa*, *Oleandra nodosa*, and *Polypodium peltideum.* The second prize was awarded to Hovey & Co. for *Adiantum decorum*, *A. trapeziforme*, *Alsophila Van Geerti*, *Asplenium Fabianum*, *Davallia Mooreana* and *D. Tyermanni.*

For the best three Ferns to J. W. Merrill for *Aglaomorpha Meyeriana*, *Nephrodium giganteum*, and *Polypodium spectrum.* The second to President Gray for *Adiantum cuneatum elegans*, *A. gracillimum*, and *Niphobolus Lingua crispata.*

Adiantums.—For six varieties, the first prize was awarded to S. R. Payson for remarkably well grown plants of *amabile*, *cune-*

atum, *Farleyense*, *formosum*, *gracillimum*, and *macrophyllum*. The second to President Gray for *assimile*, *cultratum*, *cuneatum*, *excisum multifidum*, *Lindeni*, and *Peruvianum*.

Lycopods were not as good as usual; President Gray was the only exhibitor, and was awarded the second prize for *apothecum*, *apus*, *serpens*, *Karstenianum*, *viticulosum*, and *retusum*.

Dracænas.—The best six named varieties were exhibited by H. H. Hunnewell, in very choice plants of *amabilis*, *Baptistii*, *magnifica*, *Mooreana*, *Weismanni*, and *Youngii*. The second prize went to Hovey & Co. for very fine plants of *amabilis*, *ferrea*, *Hendersoni*, *imperialis*, *Shepherdii*, and *Youngii*.

Palms.—For the best single specimen, the first prize was awarded to S. R. Payson for *Pritchardia Pacifica*,—a very large plant of this remarkably robust growing species; the leaves are very large; color, rich dark green. The second prize to Hovey & Co., for *Phœnix reclinata*, of which Williams says, "it is a fine greenhouse palm, and will stand uninjured in the sub-tropical garden in summer."

Pitcher Plants were not quite as good as we could wish to see. President Gray was the only exhibitor, taking the second prize with *Sarracenia purpurea*, *S. psittacina*, and *S. rubra*.

Agaves.—Very admirable plants were exhibited by Hovey & Co., who took the first prize with *Americana medio-picta*, *applanata*, *Besseriana candida*, *heteracantha cœrulescens*, *hystrix*, and *xylinacantha*.

No exhibit was made of Cacti or Succulents.

New Pot Plant, never before shown at any exhibition of the Society. This prize was awarded to S. R. Payson for *Maranta Massangeana*, "a very elegant and distinct novelty, of dwarf compact habit; leaves, ovate; ground color, olive green, beautifully blotched with brown; up the centre of the leaf there is a broad irregular band of white. The primary veins are very prominent, and of the same color." Hovey & Co. presented, in competition, *Dracæna Goldieana*. The plant being of recent importation was not in such a condition that the Committee could judge of its merits, but is highly commended by its European introducers.

Gladioli.—The exhibit was not as large as in some previous years; George Craft and J. S. Richards were the only competitors, the former receiving the first prize for a stand of very choice flowers, but with defects in their arrangement, the intro-

duction of cannas, and other foliage than that of gladioli, marring the general effect. The gladiolus being a plant of sparse foliage the eye naturally seeks the well developed spike of flowers, without regarding other features. J. S. Richards was second with a fine collection, lacking somewhat in dark colors, but remarkably well arranged. James Cartwright and E. Sheppard also exhibited gladioli. Mr. Cartwright has several times during the season shown uncommonly good flowers.

Dahlias.—The exhibit was better than for many previous years. For twelve blooms, H. Grundel was first with

Beauty of Wilts,	Julia Davis,
Charles Breckus,	Lady Gladys Herbert,
Duchess,	Princess,
Fanny Stewart,	Thomas Goodwin,
Gipsy King,	Vesuvius,
John McPherson,	Victory.

S. G. Stone was second with

Duke of Edinburgh,	Monarch,
Eva,	Mrs. Harris,
James Crocker,	Orient,
John Standish,	Ovid,
Maid of Essex,	Princess,
Miss Saunders,	William Lucas.

Hovey & Co. were third with

Chief,	Picotee,
George Goodhall,	Princess,
James Crocker,	Prospero,
John Lamont,	Rev. J. B. M. Camm,
King of Beauties,	Thomas Goodwin,
Peri,	William Lucas.

For six blooms, the first prize was given to S. G. Stone for Cremorne, Duchess of Cambridge, Lord Derby, Mrs. Edwards, Peri, and Queen of Beauties. The second to S. G. Stone for Le Phare, Lettie Coles, Lord Hawke, Picotee, Queen Mab, and Thomas White. The third to James Nugent for Delicata, John Standish, Lord Derby, Peri, Primrose Perfection, and Snow Fleece.

For the best single bloom, the first prize to S. G. Stone, for Henry Walton, and the second to Macey Randall, for John Standish.

Liliputians were noticeably fine; Macey Randall, J. F. Marble, and S. G. Stone, were the exhibitors.

Cut Flowers.—There was a deficiency in this department, possibly caused by the reduction in the number of prizes; W. K. Wood, Mrs. E. M. Gill, and James Nugent, were the only competitors, and the three prizes were awarded in that order.

Baskets of Flowers.—Those from Mrs. S. Joyce and Miss S. W. Story were particularly good; so closely contested was this prize that the Committee had considerable difficulty in deciding on the awards.

Rustic Stand.—The only exhibitor was W. J. Vass, with a well designed stand, filled with very choice plants.

Table Designs.—These were all well executed by Mrs. A. D. Wood, Mrs. E. M. Gill, and C. H. Hovey & Co.; Mrs. Wood taking the first, and Mrs. Gill the second prize.

New and Miscellaneous Plants, etc.—F. L. Harris presented a new seedling *Dracæna*, No. 20, which he has named *Harrisii*, a cross between *D. Regina* and *D. stricta;* a very robust growing plant; color, a beautiful dark green, with a more generally variegated habit than *Regina*, in this respect resembling *stricta*, though more distinct, the variegation on the upper leaves extending almost to the midrib. The Committee awarded Mr. Harris a Silver Medal.

Hovey & Co. showed *Lilium Neilgherrense*, a new variety from India; the plant being recently imported was not in the best condition to show its true merit; foreign descriptions pronounce it the most magnificent of all Indian lilies. It grows eight thousand feet above the level of the sea.

F. B. Hayes presented a small plant of *Pinus Massoniana var.*, a recent introduction from Japan by Thomas Hogg, which promises to be a great acquisition; probably perfectly hardy; the coloring is peculiarly beautiful, varying from white to green and yellow. Also, a rare specimen, from Japan, of *Castanea aurea var.*, the leaves distinctly marked with delicate white and green; it is of vigorous habit, and perfectly hardy.

W. C. Strong & Co. exhibited a young Pear tree upon the *Cydonia Japonica* stock. This union is a new experiment, and it is hardly time to judge of its practical usefulness. The same contributors also presented thirty-three varieties of ornamental foliage of hardy trees and shrubs, including Maple, Elm, Beech, Birch, Peach, Hazel, Golden Ash, Golden Spiræa, etc.

J. F. M. Farquhar exhibited a design for a garden, measuring

five feet two inches in length, and four feet nine inches in width, arranged in generally good taste, and forming quite a prominent feature of the exhibition. The design was remarkably well adapted to the purpose, the chief defect being in some of the proportions, and in a slight want of harmony in the combinations of color in planting.

October 5.

F. B. Hayes showed foliage of a plant received by him as *Polygonum Japonicum*, — a rapid growing, hardy, climbing plant, with variegated foliage, in shades of green, gold and mixed colors. Also, *Weigelia alba*, pure white and a profuse bloomer. Miss S. W. Story exhibited *Eulalia Japonica*, a lovely Japanese ornamental grass, with variegated foliage. It attains the height of six or seven feet, and is crowned in the autumn with graceful plumes of pale purple flowers, rivalling those of the *Gynerium* in beauty. Retaining its flowers persistently in the winter, it is admirably adapted for decorative purposes. From W. C. Strong came very finely tinted foliage of the new weeping cut-leaved Maple.

CHRYSANTHEMUM SHOW.

November 9.

The collection of plants shown was not as large as that of last year, but was remarkably good. Messrs. F. L. Ames and H. L. Higginson were the exhibitors of the larger classes. Mr. Ames' plants were well flowered, and the varieties well chosen, but the grouping lacked that harmony of color which adds so much to the effect of a stand of flowered plants. Mr. Higginson's plants were particularly well grown, and were grouped with good effect, but deficient in variety of color.

In the general display of cut blooms, E. Sheppard presented a fine selection in the following varieties:

Alarm,
Aurea,
Boadicea,
Bob,
Bronze Jardin des Plantes,
Cossack,
Durnflet,
Duchess of Manchester,
Duke of Edinburgh,
Duke of Roxburgh,

Ellen Turner,
Empress of India,
Erecta Superba,
Fair Maid of Guernsey,
Gen. Canrobert,
Golden Circle,
Goldlight,
Helen McGregor,
Jardin des Plantes,
Julia Lagravere,
La Brunette,
Lady Slade,
La Fiancée.
La Grande,
Laurinda,
Mad. de Vatry,
Maroon Model,
Mount Etna,
Mrs. George Rundel,
Mrs. Haliburton,
Mrs. Sharp,
Magesta Violet,
Nellie,
Ne Plus Ultra,
Niobe,
Prince of Wales,
Progne,
Purple King,
Rifleman,
Rosabella,
Rose Perfection,
Rosetta,
Snowball,
Venus,
Volunteer,
White Venus,

Mr. Higginson was the only exhibitor of large-flowering varieties, and received the first prize. Mr. Ames took the first prize for Pompons, with Gen. Canrobert, La Fiancée, Ninette, Drunflet, Mad. Vatry, and Mad. Milliez.

There were good stands of Chrysanthemums from Mrs. E. M. Gill, James Nugent, and J. B. Moore. Single specimen plants were shown by E. Sheppard, F. L. Ames, H. L. Higginson, and W. J. Vass.

Mr. Ames contributed a remarkably fine plant of *Nepenthes Chelsoni*, a new variety, with very large pitchers, of light green; the growth of the plant evinced the skill of his gardener, Mr. Robinson. We hope to see more of these curious and interesting plants presented for competition. From the same source came some very fine orchids and other plants as follows: *Cattleya labiata*, *Cypripedium Harrisianum*, *C. Sedeni*, *Oncidium Barkeri*, *Capsicum Princess of Wales*, and *Sonerila Hendersonii*, the last "a stove-plant of great beauty," leaves dark olive green, spotted with pearly white; under surface marbled and veined with crimson; flowers bright lilac rose.

E. Sheppard brought cut blooms of some superior Pelargoniums, as follows:

Atlanta,	Gelein Souagie,
Cleopatra,	Helen Dick,
Cornet,	King Albert (ivy-leaved),
Député Varroy,	La Claire,
Dr. Guigneau,	Mad. Thibaut,
Édouard Lequin,	Marie Bertier.

J. B. Moore contributed a pretty vase of flowers, including beautiful blooms of *Lapageria rosea* and *alba*.

It is greatly to be regretted that the necessity for retrenchment in the expenses of the Society, compels the adoption of very radical changes in the prize Schedule, and the reduction in the number of exhibitions for the coming season; but we trust the pecuniary deficiency will not be long continued, and that by united and energetic action on the part of exhibitors and standing committees, such drawbacks may be entirely overcome.

This Committee unanimously believe that a grand semi-centennial exhibition and celebration would be most conducive to awakening interest, and showing the progress of the Society in its half-century of life.

The amount of money prizes awarded by the Committee is $2,068, out of the appropriation of $2,250, leaving a balance of $182. Prizes were offered from the income of the Hunnewell Funds to the amount of $119, of which $36 was awarded.

This report was approved by the Committee, December 7, 1878.

WM. H. SPOONER, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

January 5.

Gratuities :—

James Comley, Cut Flowers,	$1 00
J. B. Moore, " "	1 00
C. M. Atkinson, " "	1 00

January 12.

Gratuity :——

James Comley, Cut Flowers,	1 00

January 19.

Gratuities :—

James Comley, Cut Flowers,	2 00
Mrs. E. M. Gill, " "	1 00

January 26.

Gratuity :—

Mrs. A. D. Wood, *Iris cristata*,	2 00

February 2.

Gratuities :—

Mrs. A. D. Wood, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
A. P. Calder, Lilacs,	1 00
J. B. Moore, fine Roses,	1 00
L. H. Foster, Roses,	1 00
C. B. Gardiner, "	1 00

February 9.

Gratuities :—

James Comley, Cut Flowers,	2 00
Mrs. A. D. Wood, " "	1 00
Mrs. E. M. Gill, " "	1 00
Mrs. S. Joyce, " "	1 00

February 16.

Gratuity :—

C. B. Gardiner, Cyclamen,	2 00

FEBRUARY 23.

Gratuities:—

Mrs. E. M. Gill, Cut Flowers,	$2 00
Mrs. S. Joyce, " "	2 00
Mrs. A. D. Wood, " "	2 00
J. B. Moore, fine Roses,	2 00
James Comley, new Roses,	4 00

MARCH 2.

CAMELLIAS.—Display of named varieties, not less than twenty blooms, Hovey & Co.,	5 00
Second, C. M. Atkinson,	4 00
ORCHID, WINTER BLOOMING.—Single plant, F. L. Ames,	6 00
Second, C. M. Atkinson,	4 00
Third, F. L. Ames,	2 00
PARLOR BOUQUETS.—Pair, James Nugent,	5 00
CYCLAMENS.—Six pots, C. B. Gardiner,	6 00
Second, C. B. Gardiner,	5 00
CUT FLOWERS.—Fifty bottles, Mrs. E. M. Gill,	5 00
HYBRID PERPETUAL ROSES.—Six plants, of distinct varieties, James Comley,	10 00
Second, J. B. Moore,	8 00
Three plants, of distinct varieties, J. B. Moore,	6 00
Second, James Comley,	5 00
Single plant, J. B. Moore,	4 00
Second, " "	3 00
Third, James Comley,	2 00
Twelve blooms, of twelve distinct named varieties, J. B. Moore,	8 00
Six blooms, of six distinct named varieties, J. B. Moore,	4 00
TENDER ROSES.—Twelve blooms, of twelve distinct named varieties, James Comley,	6 00
Six blooms, of six distinct named varieties, James Nugent,	4 00
HYACINTHS.—Twelve distinct named varieties, in pots, C. M. Atkinson,	6 00
Six distinct named varieties, in pots, C. M. Atkinson,	4 00
Three distinct named varieties, in pots, C. M. Atkinson,	2 00
AMARYLLIS.—Three varieties, in pots, J. B. Moore,	4 00

Gratuities:—

J. B. Moore, Roses, in pots,	3 00
James Comley, Rose Monsieur Fournier,	1 00
" " new Roses,	3 00
Hovey & Co., Seedling Azaleas,	1 00
Mrs. A. D. Wood, Basket of Flowers,	3 00
C. B. Gardiner, Cyclamens,	10 00
F. L. Ames, collection of Orchids,	15 00

Hovey & Co., Camellias, in pots,	$2 00
" " Cut Camellias,	1 00
A. Whittet, collection of Heaths,	5 00
Mrs. E. M. Gill, collection of Cinerarias,	3 00
James Nugent, Cut Flowers,	2 00

March 16.

Gratuity :—

James Cartwright, *Dendrobium Wardianum*,	3 00

March 30.

Gratuities :—

W. J. Vass, Roses,	1 00
Hovey & Co., Rhododendron Countess of Derby,	1 00
Mrs. A. D. Wood, Basket of Flowers,	1 00
Mrs. S. Joyce, Cut Flowers,	1 00
James Comley, " "	1 00

AZALEA EXHIBITION.

April 6.

Indian Azaleas.—Six named varieties, in pots, Marshall P. Wilder,	25 00
Six named varieties, in not exceeding ten-inch pots, John B. Moore,	10 00
Second, Marshall P. Wilder,	8 00
Single specimen, the second prize to John B. Moore,	6 00
Cinerarias.—Six varieties, in pots, E. Sheppard,	6 00
Pansies.—Six distinct varieties, in pots, James Cartwright,	4 00
Second, J. B. Moore,	3 00
Basket of Flowers.—Best arranged, James O'Brien,	4 00
Second, Mrs. A. D. Wood,	3 00

Gratuities :—

Edward Butler, *Cypripedium barbatum grandiflorum*,	5 00
C. B. Gardiner, Cyclamen and Heath,	2 00
Hovey & Co., Azaleas,	5 00
James Comley, Pelargoniums and Azaleas,	2 00
George E. Davenport, *Pyxidanthera barbulata*,	1 00
James O'Brien, Pansies,	1 00
Miss S. W. Story, Floral Design,	2 00
W. J. Vass, fine Cut Flowers,	6 00
J. B. Moore, " "	3 00
James Comley, " "	3 00
Mrs. E. M. Gill, " "	2 00
J. B. Moore, collection of Azaleas,	4 00
James Nugent, Cut Flowers,	2 00

April 27.

Gratuities:

James Cartwright, *Dendrobium Parishii*,	$1 00
" " *Phaius Wallichii*,	2 00
George E. Davenport, rare early Native Plants,	1 00

May 4.

Table Design.—Mrs. E. M. Gill,	4 00
Tulips.—Twenty-five named flowers, J. S. Richards,	5 00

Gratuities:—

James Cartwright, *Cypripedium hirsutissimum*, and *Dendrobium Devonianum*,	5 00
J. S. Richards, Pansies,	1 00
B. G. Smith, "	1 00
Mrs. E. M. Gill, "	1 00
Mrs. S. Joyce, Basket of Flowers,	3 00
Mrs. A. D. Wood, " " "	3 00
John Parker, Pelargonium "Peter Grieve,"	4 00
W. J. Vass, fine Cut Flowers,	3 00
J. B. Moore, " " "	3 00
James Nugent, Cut Flowers,	2 00
Mrs. S. Joyce, " "	1 00
E. H. Hitchings, Native Flowers,	1 00
George E. Davenport, " "	1 00
Mrs. E. M. Gill, " "	1 00
E. Sheppard, Display of Tulips,	2 00
J. S. Richards, " "	3 00
Norton Brothers, Hydrangea Thomas Hogg (very fine),	10 00
Mrs. E. M. Gill, " " "	2 00

May 11.

Gratuities:—

Francis B. Hayes, Hardy Azaleas,	1 00
Mrs. E. M. Gill, Cut Flowers,	1 00
George E. Davenport, Native Flowers,	1 00
Charles Wm. Jenks, Native Flowers,	1 00

May 18.

Gratuities:—

Mrs. A. D. Wood, Basket of Flowers,	2 00
Mrs. S. Joyce, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
B. G. Smith, Pansies,	1 00
Francis B. Hayes, new Azaleas and Rhododendrons,	2 00

May 25.

Gratuities: —

Joseph Tailby, *Dendrobium chrysotoxum*, ... $3 00
B. G. Smith, Hardy Azaleas, ... 2 00
M. H. Merriam, Hardy Azaleas, ... 1 00
Francis B. Hayes, fine Rhododendrons, ... 2 00
James Comley, Sikkim Rhododendrons, ... 1 00
J. S. Richards, collection of Tulips and Pansies, ... 4 00
F. Parkman, Seedling Clematis, ... 1 00
Marshall P. Wilder, fine Tree Pæonies, ... 3 00
O. B. Hadwen, Pansies, ... 1 00
Mrs. E. M. Gill, Cut Flowers, ... 2 00
Mrs. S. Joyce, " " 1 00

June 1.

Tree Pæonies. — Six named varieties, Marshall P. Wilder, . . 5 00
Cut Flowers. — Display, W. K. Wood, ... 6 00
Second, Mrs. E. M. Gill, ... 5 00
Table Design. — Mrs. S. Joyce, ... 5 00
Bouquets. — Pair of Parlor, James Nugent, ... 4 00
Hardy Flowering Shrubs. — Twelve named varieties, James Nugent, 4 00
Display of Cut Blooms, J. S. Richards, ... 3 00
Second, F. Parkman, ... 2 00
Third, Miss S. W. Story, ... 1 00
Native Plants. — Display of named species and varieties, Mrs. C. N. S. Horner, ... 4 00
Second, George E. Davenport, ... 3 00

Hunnewell Premiums.

Hardy Rhododendrons. — Twelve trusses of blooms, named varieties, Francis B. Hayes, ... 8 00
Single truss, Francis B. Hayes, for Mrs. Shuttleworth, . . 4 00
Hardy Azaleas. — Twenty-four named varieties, Hovey & Co., . 12 00
Six named varieties, B. G. Smith, ... 4 00
Cluster of trusses, Hovey & Co., for Superbissima, . . . 2 00

Gratuities: —

H. H. Hunnewell, display of Rhododendrons, ... 5 00
B. G. Smith, Rhododendrons, ... 1 00
M. H. Merriam, Rhododendrons and Azaleas, ... 2 00
H. H. Hunnewell, collection of Azaleas, ... 5 00
" " new Clematis and *Andromeda Catesbæi*, . . 2 00
Joseph Tailby, *Cattleya Mossiæ*, ... 2 00
J. Cartwright, *Cattleya crassifolia* and *Odontoglossum Alexandræ*, 4 00
Joseph Tailby, Hydrangea Thomas Hogg, ... 1 00
Joseph H. Woodford, fine Hardy Clematis, ... 5 00

F. Parkman, Seedling Clematis, ... $1 00
" " collection of Iris, ... 1 00
John L. DeWolf, very fine Pansies, ... 2 00
B. G. Smith, Pansies, ... 1 00
James Comley, Seedling Petunias, ... 2 00
J. B. Moore, Iris and Cut Flowers, ... 3 00
James Cruickshanks, Hardy Shrubs, ... 1 00
Francis B. Hayes, Rhododendrons, ... 2 00
Miss A. C. Kenrick, Hardy Shrubs, ... 2 00
D. R. Beckford, Jr., Basket of Flowers, ... 1 00
Miss A. C. Wheeler, Dish of Flowers, ... 1 00
George Craft, Cut Flowers, ... 3 00
Mrs. C. N. S. Horner, Native Plants, ... 1 00
E. H. Hitchings, " " 2 00
F. W. Morandi, " " 3 00
E. W. Mitchell, " " 2 00

JUNE 8.

Gratuities : —

E. Sheppard, Rhododendrons and Azaleas, ... 2 00
Joseph Tailby, *Oncidium flexuosum*, ... 2 00
E. Sheppard, Double Ivy Leaved Pelargonium, King Albert, . . 2 00
Joseph H. Woodford, Hardy Clematis, ... 2 00
F. Parkman, Hardy Clematis and Seedling Perennial Poppy, . . 2 00
Mrs. L. P. Weston, Cut Flowers, ... 2 00
Mrs. E. M. Gill, " " 1 00
Mrs. S. Joyce, " " 1 00
Mrs. A. D. Wood, " " 2 00
George Craft, " " 3 00
G. E. Davenport, *Cypripedium spectabile* and *Hudsonia tomentosa*, 1 00
E. H. Hitchings, rare Native Flowers, ... 1 00
Miss K. A. Hill, " " " 1 00

JUNE 15.

Gratuities : —

Mrs. A. D. Wood, Hybrid Perpetual Roses, ... 1 00
J. B. Moore, " " " 1 00
Miss A. C. Kenrick, Cut Flowers, ... 1 00
Mrs. S. Joyce, " " 2 00
Mrs. E. M. Gill, " " 1 00
Mrs. C. N. S. Horner, Native Plants, ... 2 00

ROSE EXHIBITION.

June 19.

Hardy Perpetual Roses. — Six new varieties sent out since 1875, William Gray, Jr.,	$10 00
Twenty-four distinct named varieties, W. Gray, Jr.,	20 00
Twelve distinct named varieties, John C. Chaffin,	10 00
Second, John B. Moore,	8 00
Third, W. Gray, Jr.,	6 00
Six distinct named varieties, M. D. Spaulding,	6 00
Second, John B. Moore,	5 00
Third, J. S. Richards,	4 00
Three named varieties, John B. Moore,	4 00
Second, J. S. Richards,	3 00
Third, M. D. Spaulding,	2 00
Moss Roses. — Twelve named varieties, three clusters each, John B. Moore,	8 00
Tea Roses. — Twelve Maréchal Niel, M. D. Spaulding,	5 00
Twelve of any other variety, James Nugent, for Souvenir de Malmaison,	5 00
General Display. — J. S. Richards,	10 00
Second, E. W. Wood,	8 00
Third, John B. Moore,	5 00
Stove and Greenhouse Flowering Plants. — Six distinct varieties in bloom, to Hovey & Co.,	25 00
Specimen Plant. — Of a kind for which no special prize is offered, regard being had to new and rare varieties, Hovey & Co., for *Dracæna Hendersoni*,	8 00
Herbaceous Pæonies. — Ten named varieties, Hovey & Co.,	5 00
Second, A. McLaren,	4 00
Sweet Williams. — Thirty trusses, not less than six distinct varieties, E. Sheppard,	3 00
Second, James Nugent,	2 00
Third, A. McLaren,	1 00
Summer Herbaceous Plants. — Display of named species and varieties, James Nugent,	5 00
Second, Miss Sarah W. Story,	4 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, Miss E. M. Gill,	4 00
Third, James O'Brien,	3 00
Bouquets. — Pair of Parlor, James O'Brien,	4 00
Second, James Nugent,	3 00
Pair of Hand Bouquets, the second prize to James O'Brien,	3 00

Gratuities:—

Warren Heustis, Hybrid Perpetual Roses,	$2 00
F. Parkman, " " "	1 00
John C. Chaffin, " " "	1 00
J. S. Richards, " " "	1 00
James O'Brien, " " "	1 00
F. F. Raymond, Moss Roses,	3 00
M. D. Spaulding, Tea "	1 00
James Bard, General Jacqueminot Roses,	2 00
W. H. Spooner, collection of Roses,	5 00
C. H. Hovey & Co., Basket of Roses,	2 00
D. R. Beckford, Jr., " " "	1 00
E. L. Beard, *Odontoglossum*,	2 00
Joseph Tailby, *Cattleya Mossiæ*,	2 00
F. L. Ames, collection of fine Orchids,	15 00
W. C. Strong, Foliage of fine hardy Trees and Shrubs,	3 00
Herbert Gleason, Herbaceous Pæonies,	1 00
B. G. Smith, *Kalmia latifolia*,	1 00
Francis B. Hayes, *Hydrangea Otaksa* (true), and other Flowers,	2 00
Curtis, Cobb & Washburn, Japan Maples, *Retinispora*, and *Biota*,	3 00
Mrs. G. A. Estabrook, Pansies,	2 00
Mrs. S. Joyce, Herbaceous Plants,	1 00
John B. Moore, Display of Flowers,	1 00
James Comley, " " "	1 00
E. Sheppard, Cut Flowers,	3 00
Mrs. L. P. Weston, " "	2 00
George Craft, " "	3 00
Miss A. C. Kenrick, " "	1 00
James Nugent, " "	1 00
Mrs. S. Joyce, Basket of Flowers,	3 00
E. H. Hitchings. Rare Native Plants,	2 00
Mrs. C. N. S. Horner, " " "	2 00
George E. Davenport, " " "	1 00
Miss K. A. Hill, Native Flowers,	1 00
M. W. Clark, *Myosotis palustris*,	1 00

JUNE 22.

Gratuities:—

J. B. Moore, Hybrid Perpetual Roses,	3 00
Warren Heustis, " " "	1 00
M. H. Merriam, " " "	1 00
B. G. Smith, " " "	1 00
Mrs. S. Joyce, Cut Flowers,	1 00

STRAWBERRY SHOW.

June 26.

Delphiniums.—Six named varieties, A. McLaren,	$4 00
Second, J. B. Moore,	3 00
Cut Flowers.—Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, George Craft,	3 00
Basket of Flowers.—C. H. Hovey & Co.,	3 00
Gratuities:—	
William Gray, Jr., very fine Hybrid Perpetual Roses,	5 00
John B. Moore, " " " "	4 00
J. S. Richards, " " " "	3 00
B. G. Smith, " " "	1 00
Mrs. A. D. Wood, Basket of Roses,	2 00
Warren Heustis, Roses,	1 00
M. H. Merriam, Hybrid Perpetual Roses, and Display of Flowers,	3 00
J. B. Moore, Roses and Sweet Williams,	2 00
James Nugent, " " "	1 00
W. H. Spooner, Seedling Delphiniums,	1 00
Parker Barnes, fine " "	1 00
Joseph Tailby, *Lilium auratum* and *Hydrangea*,	2 00
Harry L. Rand, Sweet Williams,	2 00
James Comley, Cut Flowers and Fuchsias,	3 00
Mrs. L. P. Weston, Cut Flowers,	2 00
J. C. Hovey, " "	1 00
Miss E. M. Harris, " "	1 00
Mrs. S. Joyce, Basket of Flowers, and Display,	3 00
D. R. Beckford, Jr., Basket of Flowers,	1 00
Miss E. M. Harris, Table Design,	3 00
E. H. Hitchings, Native Flowers,	1 00
" " Rare Native Ferns,	1 00
D. R. Beckford, Jr., Native Flowers,	1 00

June 29.

Gratuities:—	
B. G. Smith, Hybrid Perpetual Roses,	1 00
Mrs. S. Joyce, Cut Flowers,	1 00

July 6.

Carnations and Picotees.—Cut Blooms, twenty-four bottles, the second prize, to James Nugent,	4 00
Cut Flowers.—Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Table Design.—Mrs. S. Joyce,	3 00
Second, C. H. Hovey & Co.,	2 00

Gratuities:—

E. L. Beard, Orchids, ... $3 00
J. B. Moore, fine Gloxinias, ... 2 00
A. P. Calder, *Nymphæa odorata*, var. *rosea*, ... 1 00
James Nugent, Display, ... 2 00
J. B. Moore, " 2 00
Mrs. L. P. Weston, Cut Flowers, ... 1 00
Miss S. W. Story, " " 1 00
Mrs. E. M. Gill, Basket of Flowers, ... 1 00
D. R. Beckford, Jr., Native Flowers, ... 1 00

JULY 13.

CUT FLOWERS.—Display, W. K. Wood, ... 5 00
Second, James O'Brien, ... 4 00
Third, Mrs. E. M. Gill, ... 3 00
HAND BOUQUETS.—Pair, W. J. Vass, ... 3 00
Second, James Nugent, ... 2 00
TABLE DESIGN.—Mrs. S. Joyce, ... 3 00
Second, C. H. Hovey & Co., ... 2 00

Gratuities:—

E. L. Beard, *Torenia Fournieri*, and *Oncidium hastatum*, . . 2 00
Joseph Tailby, *Brassia verrucosa*, ... 2 00
James Cartwright, *Oncidium altissimum*, ... 1 00
J. B. Moore, fine Gloxinias, ... 2 00
J. S. Richards, Carnations, ... 1 00
" " *Lilium longiflorum*, ... 2 00
Stiles Frost, " " 1 00
Hovey & Co., Basket of Allamandas, ... 2 00
J. B. Moore, Hollyhocks and Roses, ... 2 00
J. S. Richards, " 1 00
A. McLaren, " and Display, ... 1 00
Francis B. Hayes, Display of Flowers, ... 2 00
James Nugent, Pinks and Petunias, ... 1 00
Miss S. W. Story, Basket of Flowers, ... 1 00
Mrs. A. D. Wood, " " 1 00
W. J. Vass, choice Cut " 1 00
George Craft, " " 2 00
HOLLYHOCKS. — Twelve blooms, of twelve distinct colors, J. B. Moore, ... 6 00
Second, E. Sheppard, ... 4 00
Six blooms, of six distinct colors, James Nugent, ... 5 00
Second, J. S. Richards, ... 3 00
Three blooms, of three distinct colors, J. S. Richards, . . . 2 00
ORCHIDS. — Three varieties, in bloom, F. L. Ames, . . . 6 00

Cut Flowers. — Display, W. K. Wood,	$5 00
Second, James O'Brien,	4 00
Third, Mrs. E. M. Gill,	3 00
Basket of Flowers. — The second prize to Mrs. S. Joyce,	2 00
Gratuities: —	
James Comley, *Cymbidium aloifolium*,	3 00
James Cartwright, *Cattleya Loddigesii*,	1 00
J. W. Manning, *Yucca filamentosa*,	2 00
J. B. Moore, Hollyhocks and Phlox,	2 00
Miss A C. Wheeler, Hollyhocks and other Flowers,	1 00
J. S. Richards, Hollyhocks and Roses,	2 00
E. Sheppard, "	1 00
H. Grundel, "	1 00
James Nugent, Hand Bouquets,	1 00
Emma H. Gage, Basket of Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
Miss S. W. Story, Table Design and Cut Flowers,	3 00
W. J. Vass, fine Cut Flowers,	3 00
George Craft, " "	2 00
James Nugent, " "	1 00
James Comley, Native Flowers,	1 00
E. W. Mitchell, collection of Fungi,	1 00

July 27.

Cut Flowers. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, James O'Brien,	3 00
Fifty named varieties of Greenhouse Flowers, the third prize to Miss S. W. Story,	3 00
Basket of Flowers. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00
Gratuities: —	
Joseph Tailby, *Lilium auratum*,	1 00
E. Sheppard, Hollyhocks and Verbenas,	2 00
Herbert Gleason, Gladioli and Tritomas,	1 00
J. S. Richards, Gladioli and Dahlias,	2 00
F. Parkman, Seedling Phlox,	1 00
James Nugent, Hand Bouquets and Tritomas,	1 00
Mrs. E. M. Gill, Basket of Allamandas,	1 00
J. B. Moore, fine Cut Flowers,	2 00
Mrs. A. D. Wood, Basket of Flowers,	1 00
Miss Sarah W. Story, " "	1 00
F. B. Hayes, Display of Flowers,	2 00
Mrs. H. D. Wilmarth, *Sabbatia chloroides* (white and pink),	1 00
Mrs. C. N. S. Horner, named Native Flowers,	3 00
D. R. Beckford, Jr., " "	2 00
Mrs. E. M. Gill, " "	1 00

August 3.

Stocks. — Six varieties, one cut plant of each, the second prize to J. S. Richards,	$2 00
Balsams. — Twelve spikes, eight varieties, the second prize to J. B. Moore,	2 00
Third, Mrs. S. Joyce,	1 00
Hand Bouquets. — Pair, James O'Brien,	3 00
Second, W. J. Vass,	2 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, James O'Brien,	3 00
Fifty named varieties of Annuals and Herbaceous Perennials, J. B. Moore,	5 00
Second, Mrs. S. Joyce,	4 00
Table Design. — Mrs. S. Joyce,	3 00
Second, C. H. Hovey & Co.,	2 00
Gratuities : —	
J. S. Richards, Gladioli,	5 00
James Cartwright, "	1 00
M. H. Merriam, " and White Balsams,	2 00
E. Sheppard, *Lilium auratum*,	1 00
James Comley, Pinks and Sweet Peas,	1 00
Warren Heustis, Roses and Lilies,	1 00
Mrs. E. M. Gill, Table Design,	1 00
Miss S. W. Story, " "	1 00
W. J. Vass, Display of Flowers,	1 00
George Craft, " "	1 00
Mrs. C. N. S. Horner, Native Flowers,	3 00
E. H. Hitchings, " "	1 00
G. E. Davenport, " Plants,	1 00

August 10.

Perennial Phlox. — Ten distinct named varieties, J. B. Moore,	4 00
Third prize, A. McLaren,	2 00
Petunias. — Fifty bottles, not over three spikes in a bottle, the second prize to Mrs. William Latham,	3 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Third, W. J. Vass,	3 00
Basket of Flowers. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00
Gratuities : —	
J. S. Richards, Gladioli,	3 00
M. H. Merriam, "	2 00
Herbert Gleason, "	1 00

Warren Heustis, Roses and Lilies,	$1 00
Miss S. W. Story, Table Design,	1 00
E. H. Hitchings, *Habenaria ciliaris*,	1 00

August 17.

Gladioli. — Twenty named varieties, in spikes, A. McLaren,	8 00
Second, George Craft,	6 00
Third, J. S. Richards,	4 00
Ten named varieties, in spikes, J. S. Richards,	4 00
Second, M. H. Merriam,	3 00
Third, A. McLaren,	2 00
Display of named or unnamed varieties, J. S. Richards,	8 00
Second, M. H. Merriam,	6 00
Third, Herbert Gleason,	4 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, J. B. Moore,	4 00
Third, Mrs. E. M. Gill,	3 00
Fifty named varieties of Annuals and Herbaceous Perennials, J. B. Moore,	5 00
Second, Mrs. S. Joyce,	4 00
Third, W. K. Wood,	3 00
Table Design. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00
Gratuities:	
E. L. Beard, fine Orchids,	2 00
Miss S. W. Story, *Lilium lancifolium*,	1 00
Mrs. E. M. Gill, Allamandas and Lilies,	1 00
C. H. Hovey & Co., Basket of Allamandas,	1 00
Joseph Tailby, Pancratiums and seedling Carnations,	1 00
Warren Heustis, Roses and Lilies,	1 00
Miss E. M. Harris, Table Design of Native Ferns,	1 00
George Craft, Cut Flowers,	1 00
James Comley, Display of Flowers,	2 00
F. B. Hayes, " "	1 00
B. G. Smith, " "	1 00
James Nugent, " "	1 00
E. W. Mitchell, collection of Fungi,	1 00
E. H. Hitchings, Native Plants,	2 00

August 24.

Asters. — Thirty flowers, not less than ten varieties, E. Sheppard,	5 00
Second, J. B. Moore,	4 00
Third, J. A. Black,	3 00
Fifteen flowers, not less than six varieties, Hovey & Co.,	3 00
Second, George Hill,	2 00
Third, James Nugent,	1 00

Cut Flowers. — Display, W. K. Wood,	$5 00
Second, Mrs. E. M. Gill,	4 00
Third, James O'Brien,	3 00
Basket of Flowers. — C. H. Hovey & Co.,	3 00
Second, Mrs. S. Joyce,	2 00

Gratuities : —

J. S. Richards, collection of Gladioli,	3 00
" " choice Gladioli,	1 00
J. B. Moore, Caladiums, in pots, and Cut Flowers,	2 00
W. H. Spooner, Nasturtiums and Lilies,	2 00
E. Sheppard, Lilies and Asters,	1 00
Mrs. S. Joyce, Lilies,	1 00
S. G. Stone, Dahlias,	1 00
R. Petremant, *Scilla maritima*,	1 00
Miss S. W. Story, Dish of Flowers,	1 00
Miss A. C. Wheeler, Basket of Flowers,	1 00
C. H. Hovey & Co., " "	1 00
Miss E. M. Harris, Moss Covered Basket,	1 00
Mrs. C. B. Chase, Display of Flowers,	1 00
B. G. Smith, " "	1 00
James Nugent, " "	1 00
E. H. Hitchings, rare Native Plants,	1 00
Miss S. Carter, 2d, " " "	1 00
Joseph Comley, collection of Fungi,	1 00

August 31.

Lilies.—Display of *Lilium lancifolium*, cut flowers, Mrs. E. M. Gill,	3 00
Second, W. H. Spooner,	2 00
Verbenas.—Fifty bottles, E. Sheppard,	3 00
Second, J. B. Moore,	2 00
Third, A. McLaren,	1 00
Cut Flowers. — Display, W. K. Wood,	5 00
Second, Mrs. E. M. Gill,	4 00
Native Plants. — Display of named species and varieties, Mrs. C. N. S. Horner,	4 00
Second, D. R. Beckford, Jr.,	3 00
Third, E. W. Mitchell,	2 00

Gratuities : —

George Craft, collection of Gladioli,	3 00
J. S. Richards, " "	3 00
James Cartwright, collection of fine Gladioli,	2 00
S. G. Stone, Dahlias,	1 00
Macey Randall, fine Dahlias,	2 00
B. G. Smith, *Lilium lancifolium*,	1 00
Mrs. S. Joyce, Lilies and Basket of Flowers,	2 00

J. B. Moore, Clematis, ... $1 00
Norton Brothers, Asters, in pots, ... 2 00
Miss S. W. Story, Table Design, ... 1 00
Miss E. M. Harris, Design, ... 1 00
C. H. Hovey & Co., Basket of Flowers, ... 1 00
Miss A. C. Wheeler, Dish of Flowers, ... 1 00
Mrs. A. D. Wood, " " 1 00
F. B. Hayes, Display of Flowers, ... 2 00
James Nugent, " " 1 00
George E. Davenport, rare Native Plants, ... 1 00

SEPTEMBER 7.

DOUBLE ZINNIAS. — Twenty flowers, six varieties, J. B. Moore, . 4 00
Second, Herman Grundel, ... 3 00
Third, George Craft, ... 2 00
Ten flowers, four varieties, J. L. Childs, ... 3 00
Second, Mrs. William Latham, ... 2 00
Third, James Nugent, ... 1 00
CUT FLOWERS. — Display, W. K. Wood, ... 5 00
Second, Mrs. E. M. Gill, ... 4 00
BASKET OF FLOWERS. — Mrs. S. Joyce, ... 3 00
Second, C. H. Hovey & Co., ... 2 00

Gratuities: —

George Craft, fine Gladioli, ... 3 00
James Cartwright, " " 2 00
Hovey & Co., *Coleus multicolor*, ... 1 00
S. G. Stone, fine Dahlias, ... 1 00
James Nugent, Hand Bouquets, ... 1 00
Mrs. C. B. Chase, Basket of Flowers, ... 1 00
Miss A. C. Wheeler, " " 1 00
Miss S. W. Story, Table Design and Flowers, ... 2 00
James Nugent, Display of Flowers, ... 1 00
J. L. Childs, " " 1 00
J. B. Moore, " " 1 00
B. G. Smith, " " 1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, and 20.

GREENHOUSE PLANTS. — Twelve greenhouse and stove plants of different varieties, H. H. Hunnewell, ... $30 00
Second, S. R. Payson, ... 25 00
SPECIMEN PLANT. — Not variegated, of a kind for which no special prize is offered, William Gray, Jr., ... 6 00
Second, Hovey & Co., ... 4 00

Specimen Flowering Plant. — Hovey & Co.,	$6 00
Second, Hovey & Co.,	4 00
Variegated Leaved Plants. — Six varieties, not offered in the collection of greenhouse plants, H. H. Hunnewell,	15 00
Second, William Gray, Jr.,	10 00
Single specimen, not offered in any collection, Hovey & Co.,	6 00
Second, W. J. Vass,	4 00
Caladiums. — Six varieties, William Gray, Jr.,	6 00
Second, E. Sheppard,	5 00
Ferns. — Six named varieties, J. Warren Merrill,	8 00
Second, Hovey & Co.,	6 00
Three new varieties, J. Warren Merrill,	5 00
Second, William Gray, Jr.,	4 00
Adiantums. — Six varieties, S. R. Payson,	8 00
Second, William Gray, Jr.,	6 00
Lycopods. — Six named varieties, the second prize to William Gray, Jr.,	3 00
Dracænas. — Six named varieties, H. H. Hunnewell,	10 00
Second, Hovey & Co.,	6 00
Palms. — Single specimen, S. R. Payson,	6 00
Second, Hovey & Co.,	4 00
Pitcher Plants. — Three, the second prize to William Gray, Jr.,	6 00
Agaves. — Six distinct varieties, Hovey & Co.,	8 00
New Pot Plant. — Never before shown at any exhibition of the Society, S. R. Payson, the Society's Silver Medal.	
Rustic Stand. — Not less than three feet in height, planted with choice plants, W. J. Vass,	5 00
Gladioli. — 200 bottles, best kept during the exhibition, of named or unnamed varieties, George Craft,	10 00
Second, J. S. Richards,	8 00
Dahlias. — Twelve named varieties, H. Grundel,	6 00
Second, S. G. Stone,	5 00
Third, Hovey & Co.,	4 00
Six named varieties, S. G. Stone,	4 00
Second, S. G. Stone,	3 00
Third, James Nugent,	2 00
Single flower, S. G. Stone,	2 00
Second, Macey Randall,	1 00
Liliputian Dahlias. — 50 bottles, Macey Randall,	4 00
Second, J. F. Marble,	3 00
Third, S. G. Stone,	2 00
Parlor Bouquets — Pair, on Wednesday, H. Grundel,	4 00
Pair, on Thursday, H. Grundel,	4 00
Second, W. J. Vass,	3 00
Hand Bouquets. — Pair, on Wednesday, Mrs. S. Joyce,	4 00
Second, H. Grundel,	3 00
Pair, on Thursday, H. Grundel,	4 00
Second, Mrs. S. Joyce,	3 00

CUT FLOWERS. — 150 bottles, best kept during the exhibition, W. K. Wood, ... $18 00
Second, Mrs. E. M. Gill, ... 16 00
Third, James Nugent, ... 14 00
BASKET OF FLOWERS. — Best arranged and best kept through the exhibition, Mrs. S. Joyce, ... 6 00
Second, Miss S. W. Story, ... 5 00
TABLE DESIGN. — Best kept through the exhibition, without fruit, not over four feet high, Mrs. A. D. Wood, ... 8 00
Second, Mrs. E. M. Gill, ... 5 00

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS. — The second prize for display to J. W. Manning, ... 6 00

Gratuities: —

W. J. Vass, collection of Plants, ... 12 00
Norton Bros., " " 8 00
Hovey & Co., " " 6 00
Daniel Duffley, *Anemone Japonica*, ... 2 00
" " Celosias, ... 2 00
W. C. Strong & Co., collection of Variegated Leaved Plants, . . 3 00
E. Sheppard, collection of Roses, ... 1 00
James Comley, fine Roses, ... 1 00
E. Sheppard, collection of Coleus, ... 4 00
Henry Ross, " " 5 00
Hovey & Co., *Lilium Neilgherrense*, ... 1 00
J. Warren Merrill, New and Rare Ferns, ... 5 00
Miss S. W. Story, *Erianthus Ravennæ*, ... 1 00
" " " Display of Dianthus, ... 1 00
J. B. Moore, *Maranta Makoyana*, and *Caladium argyrites*, . . 3 00
S. R. Payson, Caladiums, ... 4 00
F. B. Hayes, for *Magnolia tripetala*, in fruit, and *Hibiscus moscheutos*, 2 00
W. J. Vass, Display of *Passiflora princeps*, ... 3 00
James Cartwright, Orchids, ... 4 00
" " Gladioli, ... 3 00
E. Sheppard, " 2 00
W. H. Spooner, Nasturtiums and Tritomas, ... 2 00
H. Grundel, fine White Balsams, ... 1 00
Hovey & Co., White Dahlias, ... 1 00
" " *Dahlia viridiflora*, ... 1 00
S. G. Stone, collection of Dahlias, ... 2 00
Macey Randall, " " 1 00
George Craft, Display of Cockscombs, ... 1 00
R. Manning, Cornelian Cherry, ... 1 00
W. C. Strong & Co., Display of Flowers, ... 3 00
George Craft, " " 3 00
J. S. Richards, " " 2 00

F. B. Hayes, two Vases of Flowers, ... $5 00
J. F. M. Farquhar, Design for a Garden, ... 15 00
Mrs. W. H. Bates, Table Design, ... 3 00
Miss E. M. Harris, Design of Native Flowers, ... 5 00
E. H. Hitchings, varieties of *Botrychium ternatum*, ... 2 00
Mrs. C. N. S. Horner, Native Flowers, ... 3 00
D. R. Beckford, Jr., " " 2 00

October 5.

Table Design. — Mrs. S. Joyce, ... 3 00
Hand Bouquets. — Pair, James Nugent, ... 3 00
Vase of Flowers. — Best arranged, Mrs. E. M. Gill, ... 5 00

Gratuities: —

W. C. Strong, Autumn Foliage of New Cut Leaved Maples, . . 1 00
William Beet, Large Sunflower, ... 1 00
Miss S. W. Story, *Eulalia Japonica*, ... 2 00
W. H. Spooner, *Tritoma Uvaria*, ... 1 00
S. G. Stone, collection of Dahlias, ... 4 00
Macey Randall, " " 2 00
Hovey & Co., " " 1 00
E. Sheppard, " " 1 00
Miss S. W. Story, Basket of Flowers, ... 2 00
Miss A. C. Wheeler, " " 1 00
Miss E. M. Harris, Table Design, ... 2 00
W. K. Wood, Display of Flowers, ... 3 00
James Nugent " " 2 00
Mrs. L. P. Weston, " " 2 00
Mrs. E. M. Gill, Display of Flowers, ... 1 00
John Parker, " " 1 00
James Comley, " " 1 00
Miss S. W. Story, " " 1 00
E. H. Hitchings, varieties of *Botrychium ternatum*, ... 2 00

CHRYSANTHEMUM SHOW.

November 9.

Chrysanthemums. — Six distinct named Large Flowered varieties, H. L. Higginson, ... 8 00
Six distinct named Pompons, F. L. Ames, ... 8 00
Second, H. L. Higginson, ... 6 00
Four named Liliputians, H. L. Higginson, ... 4 00
Specimen Plant, E. Sheppard, ... 5 00
Second, F. L. Ames, ... 4 00
Third, H. L. Higginson, ... 3 00
Twelve named Pompon varieties, cut specimens, H. L. Higginson, 3 00
Second, James Nugent, ... 2 00

General display of named or unnamed varieties, fifty bottles, E. Sheppard,	$5 00
Second, Mrs. E. M. Gill,	4 00
Third, James Nugent,	3 00
Basket of Flowers. — Mrs. S. Joyce,	3 00
Hand Bouquets. — Pair, James Nugent,	3 00
Second, W. J. Vass,	2 00

Gratuities: —

F. L. Ames, collection of very fine Orchids and other Plants,	10 00
James Cartwright, very fine *Oncidium varicosum*,	2 00
Norton Brothers, collection of Chrysanthemums,	5 00
E. Sheppard, Geraniums and Chrysanthemums,	1 00
James Nugent, Cut Roses,	2 00
J. B. Moore, Vase of Flowers,	1 00
Mrs. A. D. Wood, Cut Flowers,	2 00
James Comley, " "	1 00
Mrs. C. N. S. Horner, Native Plants,	1 00

December 14.

Gratuity: —

J. Cartwright, Orchids,	4 00

The Committee have awarded Medals and Certificates of Merit as follows:—

Silver Medals.

January 19. H. H. Hunnewell, for *Cœlogyne cristata.*

March 2. H. H. Hunnewell, for *Cypripidium Dayanum.*

March 9. Marshall P. Wilder, for *Azalea Exquisita.*

March 23. F. L. Ames, for *Dendrobium Falconeri.*

June 1. H. H. Hunnewell, for *Azalea mollis*, and new and choice named Rhododendrons.

June 8. Francis B. Hayes, for a very choice collection of Rhododendrons and other Shrubs.

Strawberry Show, June 26. F. L. Ames, for *Lælia majalis.*

June 29. Francis Parkman, for new Seedling Japan Iris.

July 13. Francis Parkman, for new Seedling Phlox, Mrs. Derby.

July 20. F. L. Ames, for *Cattleya Dowiana.*

August 24. T. Putnam Symonds, for *Lilium auratum.*

Annual Exhibition, September 17–20. F. L. Harris, for Seedling *Dracæna Harrisii* (No. 20).

Chrysanthemum Show, November 9. F. L. Ames, for a very fine plant of *Nepenthes Chelsoni.*

Bronze Medals.

Rose Show, June 19. John C. Hovey, for new Double Pyrethrums.

John R. Brewer, for *Andromeda speciosa.*

Strawberry Show, June 26. John C. Hovey, for new Seedling Herbaceous Pæonies.

August 3. Miss S. W. Story, for *Lilium Leichtlini.*

August 17. W. H. Spooner, for new Gladiolus, Diamond.

Annual Exhibition, September 17–20. F. B. Hayes, for *Pinus Massoniana variegata.*

First Class Certificates of Merit.

March 2. F. L. Ames, for *Dendrobium Ainsworthii.*

Annual Exhibition, September 17–20. F. B. Hayes, for *Castanea aurea variegata.*

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1878.

By JOHN B. MOORE, Chairman.

Another season has passed, and the time has arrived when this Society requires a report of the doings of their Fruit Committee.

Perhaps it would be proper first to give the general conditions of the weather and season, so far as they have influenced the growth of plants and their products.

After passing through the winter season of 1877 and 1878, which, taken as a whole, was rather mild and pleasant, we had an early spring, March being remarkably mild for that usually boisterous month, and the frost leaving the ground quite early. April was mild, dry, and warm for the season, and these favorable conditions of both the weather and the soil were early taken advantage of, and all garden operations were in a very forward state at the close of the month.

The month of May was cool, with occasional sharp and, in some instances, destructive frosts. The first half of June was also cool, with frosts in some localities; up to this time, and including the whole of the spring months, there were seasonable rains. The last half of June and the first half of July were quite hot, and the surface of the ground became quite dry; still the soil was not dried so deep as to seriously check vegetation, which advanced very rapidly.

From the middle of July until September the weather was cooler, with much rain and cloudy weather, the rain falling in very heavy showers, and being in some localities accompanied with hail, which caused considerable damage to fruits, plants, and grass, beating down crops, and washing the soil from the hill-sides. In the months of September and October we had a succession of days of fine weather, and were exempted from severe frosts until nearly the first of November, while the rain was sufficient for all practical purposes. The month of November was milder than usual for the season of the year, enabling every careful person to complete his garden operations in season for the coming winter. In the last half of the month there was a very large rainfall, in one instance six and one-half inches falling in five days. The ground is saturated with water, and, as some think, is in just the right condition to freeze up for the coming winter.

It has been found by careful observation that almost every time there is what is called an early start in the spring, arising from a warm March and April, it is followed by a cold May, and perhaps June, killing plants outright by frost, and stunting and ruining others by cold days and nights. Melons, beans, and other plants have been so injured, and the early blossoms of strawberries, and others of the small fruits, have been killed by frost the present year. These early springs, which stimulate the cultivator to early planting, and in which his fond hopes are suddenly brought to grief by frosts and cold, are not desirable. Almost the only redeeming point about such a season that suggests itself to a practical person is, that one can forward his work at this busy time of the year.

The killing of strawberry blossoms, and of the small green berries by frost, which has happened the present year, would not be of so much importance (as strawberries, particularly some varieties, set more fruit than they can ripen) were it not that when the frost destroys a strawberry blossom, or a green berry, it will certainly be that one which would make the first, best, and largest fruit on the plant. In large fields this would cause a heavy loss in the value of the product.

The conditions of the weather which have been described are not common when the season opens later. Assuming our propositions concerning them to be true, cultivators can, by judicious planting, avoid some of the losses consequent upon them. They should not

plant such tender flowers, fruits, or vegetables as would be injured by frosts or cold nights, until, in their judgment, there is a reasonable prospect of settled warm weather. They should not be led astray by one or two warm days. It has been said that one swallow does not make a summer, neither does one pleasant day make a warm season.

The cool, cloudy, wet weather in August was unfavorable to the ripening of grapes, and some other crops, and unfortunately presented the conditions which favor a rapid development of mildew on the foliage of the grape, and many other plants. The rest of the season was favorable for almost all purposes. The most prominent, and perhaps most uncommon feature of the season, has been the fine verdure of the grass, and the healthy foliage on the trees from early spring until late in October.

Strawberries. — The first strawberries placed on exhibition were the Triomphe de Gand, forced in pots, and exhibited in April. The next were some berries grown in cold frames, and shown on the 25th of May. In the latter named class there was only a small competition on the prize day, June 1st. These premiums have been omitted in the list for 1879, and, in the judgment of the Committee on Fruits, very properly.

On the 26th of June the Society held its Annual Strawberry Show. The number of baskets was not as large as the previous year, and the specimens as a whole were not as good, owing, probably, to the fact that in many instances the first, or what would have been the largest berries, were killed by the frost. Still there were some fine baskets of fruit; the best was La Constante. This old variety comes to the front every few years. It is thought to be an extremely capricious variety, and not desirable for general cultivation.

The first prize for two new named varieties was awarded to Ex-President Marshall P. Wilder, for two seedlings of his own, named Hero and Abundant. They were both large and showy berries. Mr. Wilder also showed some other seedlings, but the Committee did not give any of them such an examination as would warrant an opinion. George S. Harwood exhibited some foreign kinds, taking the second prize for two new varieties with the President Green and Duke of Edinburgh. The two prizes for the best fifty berries were awarded to the Walden and the Belle. A few new varieties were exhibited early in the season from the State

of New York, but were not in good condition, and, therefore, the Committee decline to express any opinion as to their merits. No other new varieties of marked character have been shown.

The whole number of baskets and dishes of strawberries exhibited was sixty-five, a much less number than last year. Annexed will be found a description of Col. Wilder's seedlings, Hero, Abundant, and Dorchester; also, Prouty's Seedling:

Hero. — Very large; form varying from long conical to cockscomb; surface, polished crimson; seeds not deeply sunken; flesh, red, not very juicy or high flavored.

Abundant. — Large; conical, flattened, tolerably regular; seeds generally sunken and red; color, crimson; flesh, red, solid, juicy, and good; flowers, pistillate.

Dorchester. — Of good size, but not as large as the two preceding; conical, sometimes flattened laterally or cockscombed; seeds pretty deeply sunken and red; color, crimson, or inclining to scarlet; flesh, white, of tolerable flavor; flowers, pistillate.

Prouty's Seedling. — Medium size; generally long, irregular, conical, sometimes cockscombed; seeds not deeply sunken; when fresh, bright crimson, but becomes dingy; flesh, red, juicy, with a not very pleasant acid.

Cherries. — We have nothing particular to say about cherries; the old varieties, Black Tartarian and Coe's Transparent, have taken the principal prizes.

Raspberries. — July 13th and 20th the first prizes for this fruit were awarded, respectively, to the Saunders and the Pride of the Hudson; the latter being a new variety shown by E. P. Roe, of Cornwall, on the Hudson. It appeared to be of good size and fair quality, but not equal in either of these points to some berries shown later in the season.

Currants and Gooseberries. — The exhibition of currants was as fine as usual. There were no new varieties of marked excellence exhibited. The same remarks would apply to gooseberries.

Blackberries. — There was not a large show of blackberries this year, many of the bushes being winter killed; much the finest basket was the Dorchester, shown by James Nugent, August 3d.

Amelanchier. — On the 13th of July, Benjamin G. Smith exhibited fruit of *Amelanchier Canadensis*, var. *oblongifolia* T. and G., or Dwarf June Berry. This has been procured and tested at considerable expense by Mr. Smith, and as it is hardy and pro-

ductive it may prove to be desirable. The Committee have thought it proper to award to Mr. Smith the Society's Silver Medal for its introduction.

Apples. — This year being the even year we expected a large crop of apples, and we were not disappointed. It has become a settled fact that we do have large crops of apples every even year. Now, if any persons can change the bearing year of their orchards from the even to the odd year, they will be sure to realize much larger prices for their fruit; but the bearing of only a few trees in an orchard which has produced a large crop the previous year does not amount to much, for the apple maggot, and the larvæ of the codling moth and curculio, have escaped in such large numbers the previous year, as to be able to puncture and spoil nearly all the fruit from a few trees. There appear to be three causes affecting the conditions of our apple trees, which fully account for the large crop of fine apples. First, the very small crop of 1877 enabling the trees to perfect their fruit buds for the crop of 1878. Second, the much smaller number of insects to prey upon the young fruit, from the fact that they were starved out the previous year. Third, the favorable season, in which the abundance of rain gave moisture enough to cause the fruit to grow of large size. The apples shown during the whole season have been very large, fair, handsome, and of fine quality—perhaps never better. At the Annual Exhibition, there were four hundred and eight plates of apples on the tables, all of them of fine quality.

Pears. — The crop of pears has been much smaller this year than usual; there were apprehensions at one time that we should have only meagre shows of this fruit, but there has been a good exhibition the whole season, and in size and quality the specimens have been fully up to the average. We have found sufficient competition on prize days to cause nearly all the prizes to be awarded, and have had to pass by many fine dishes of this fruit.

At the Annual Exhibition there were shown on the tables three hundred and seventy-four dishes of pears; very large, smooth, handsome specimens.

Of the new seedlings, Clapp's No. 64 was shown in April; this is a sweet pear of only second rate quality, but its keeping so late in the season may make it a very desirable pear. Messrs. Clapp's Seedling No. 22, or Frederick Clapp, still maintains its character, and is a first rate pear. There have been a few other seedlings

from Messrs. Clapp, and from others, but not of such marked excellence, so far as we can judge from the examination we have been able to make, as to require a further opinion or description, except one raised by Stephen Osborne, of Peabody. This was presented May 25th, and is of medium size; globular acute pyriform; dull green, with much brownish russet, or sometimes entirely covered with russet; skin, thick; flesh, gritty, but sweet and juicy, and remarkably melting and buttery for so late a pear. Among the fine autumn varieties this would not be thought worthy of attention, but keeping almost to June it appeared deserving of notice.

Peaches have not been plenty, and a less number of dishes have been shown than usual, although there have been some very fine specimens on our tables. Quite a number of dishes of seedling peaches, some of them large and handsome, having a strong resemblance to the Crawford's Early and Crawford's Late, have been shown, but none of them perhaps quite as good as either of those standard varieties.

Plums. — The last two years show a marked increase in the number of dishes exhibited, and many of the specimens have been of fine quality. The trees do not appear to be so much troubled with the black wart as formerly, and there is a prospect of having a reasonable crop of this fine fruit again. We would suggest to persons, if they have an enclosure in which fowls are confined, and the ground is suitable in other respects, to plant it with plum trees. In such a place the trees will grow well, and, when they come to bear fruit, a jar or shake of the tree, at the proper time, will cause the curculio to fall to the ground, and they will quickly be destroyed by the fowls.

Grapes.—There has been a very small crop of grapes this season. For some reason grape vines did not show nearly as many or as strong trusses of buds for blooming this year as usual. This was not by any means confined to weak growing kinds, but the Concords, and other strong growing varieties, which have almost always set a great deal too much fruit, were as much affected as any. Pruning had nothing to do with it, for whether the vines were pruned closely or allowed to ramble it was all the same; the trusses of buds were poor and weak in the beginning, and did not appear to have strength enough to set well. This was followed in August by mildew, which injured the foliage of many varieties so

much that the poor show of fruit in June was almost destroyed, and hardly vitality enough remained in the leaves to ripen the fruit, although they were not killed by the frost until about the first of November. Some varieties have been and are more subject to mildew than other varieties; the leaves of all hybrids have been more injured than the native kinds. Why should it not be so? Is it not in accordance with the laws of reproduction that the defects of the parent will be transmitted to the progeny?

The hybrids are crosses between the foreign and native species; the foreign has two serious faults in our climate; one is a tenderness of the vine itself; the other a tendency to mildew on the foliage, and also on the fruit. When a vine is so affected as to drop nearly all its leaves in August, there is not only a loss of the crop of fruit for that year, but the vine receives such a shock that it will hardly be strong enough to withstand the rigor of a Massachusetts winter—much more to produce a crop the succeeding year. The laws of breeding plants, as well as animals, show that like produces like in the vegetable as well as in the animal kingdom,—modified somewhat by outside influences in both.

No new varieties, not before exhibited, have been shown. James H. Ricketts, of Newburg, N. Y., presented some of his new seedlings of the same varieties that have been heretofore exhibited. They were not quite as good as he has shown here before, but this was very likely owing to the unfavorable season.

There was no competition for bunches of foreign grapes, weighing not less than five pounds. For the other prizes there was a fair display, but nothing of unusual merit.

The Committee recommend to the Society that all small fruits, exhibited for prizes or gratuities, shall be shown in baskets not exceeding an inch and three-quarters in depth, and corresponding in form to a model to be adopted by the Society. The objects which it is believed will be attained by this rule are the following: First, exactness and uniformity in quantity, as required by the Schedule. Second, the Committee would be able to see nearly all the fruit in the basket, and could judge more fairly and exactly. Third, a more uniform appearance of the tables.

The appropriation for the year 1878 was $1,425; the amount awarded in prizes and gratuities was $1,225; leaving a balance of $200.

The Committee have also awarded one Silver Medal, and one First Class Certificate of Merit.

Annexed will be found a list of the prizes and gratuities awarded.

All of which is respectfully submitted.

JOHN B. MOORE,
P. B. HOVEY,
E. W. WOOD,
BENJ. G. SMITH,
JACOB W. MANNING,
DANIEL T. CURTIS,
CHAS. F. CURTIS,

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 5.

Gratuities: —

Warren Fenno, Josephine de Malines Pears, ... $1 00
Benjamin G. Smith, " " " " 1 00

February 2.

Winter Pears. — Any variety, Marshall P. Wilder, Beurre d'Anjou, 3 00
Second, Marshall P. Wilder, Beurre d'Aremberg, . . . 2 00
Winter Apples. — Any variety, C. E. Grant, Baldwin, . . . 3 00
Second, Benjamin P. Ware, Peck's Pleasant, ... 2 00

Gratuities: —

Marshall P. Wilder, collection of Pears, ... 2 00
C. E Grant, " " 1 00
Benjamin G. Smith, Pears, ... 1 00

February 9.

Gratuity: —

Warren Fenno, collection of Pears, ... 1 00

March 2.

Winter Pears. — Any variety, J. V. Wellington, Beurre d'Anjou, . 3 00
Second, J. V. Wellington, Winter Nelis, ... 2 00
Winter Apples. — Any variety, C. E. Grant, Baldwin, . . . 3 00

Gratuities: —

C. E. Grant, Catillac Pears, ... 1 00
A. S. McIntosh, Easter Beurre Pears, ... 1 00
C. D. Kingman, Oranges, ... 1 00

April 6.

Gratuities: —

A. S. McIntosh, Pears, ... 1 00
C. E. Grant, collection of Pears and Apples, ... 1 00
James Comley, Triomphe de Gand Strawberries, ... 2 00
F. & L. Clapp, Seedling Pear, No. 64, of fine appearance for the season, a First Class Certificate of Merit.

MAY 25.

Gratuity: —

Charles Garfield, Strawberries grown in a cold frame, . . . $1 00

JUNE 1.

FORCED GRAPES. — Two bunches of any variety, Cephas H. Brackett, Black Hamburg, ... 7 00
Second, Peter Smith, Black Hamburg, ... 4 00
STRAWBERRIES. — One quart of any variety, grown in a frame under glass, Charles Garfield, ... 5 00
Second, John B. Moore, ... 4 00

JUNE 8.

Gratuities: —

E. P. Richardson, Jenny Lind Strawberries, ... 1 00
C. D. Kingman, Monarch of the West Strawberries, . . . 1 00

JUNE 15.

Gratuities: —

Aaron D. Capen, Charles Downing Strawberries, ... 2 00
Warren Fenno, Brighton Pine " 2 00
Marshall P. Wilder, Hervey Davis " 1 00
George Hill, Col. Cheney " 2 00
G. M. Mellen, Cutter's Seedling " 1 00
William G. Prescott, " " 2 00
C. E. Grant, Cherries, ... 2 00

ROSE SHOW.

JUNE 19.

EARLY STRAWBERRIES. — Four quarts, open culture, Charles Garfield, 7 00
Second, John B. Moore, ... 5 00
Third, George Hill, ... 3 00
Two quarts, John B. Moore, ... 4 00
Second, Charles Garfield, ... 3 00
FORCED GRAPES. — Three varieties, two bunches of each, Cephas H. Brackett, ... 7 00
Two bunches, of any variety, Cephas H. Brackett, Black Hamburg, 4 00
Second, H. S. Mansfield, ... 3 00

Gratuities: —

C. E. Grant, collection of Cherries, ... 2 00
Miss E. M. Harris, Lennig's White Strawberries, ... 1 00
M. W. Chadbourne, Charles Downing " 1 00

STRAWBERRY SHOW.

June 26.

Strawberries. — Four quarts, of any variety, C. M. Atkinson, La Constante,	$10 00
Second, M. W. Chadbonrne, Jucunda,	8 00
Third, Marshall P. Wilder, President Wilder,	6 00
Two new named varieties, not previously exhibited, Marshall P. Wilder,	4 00
Second, George S. Harwood,	3 00
Fifty berries, of any variety, John B. Moore, Walden,	4 00
Second, Stiles Frost, Belle,	3 00
Two quarts Caroline, E. W. Wood,	3 00
Second, John B. Moore,	2 00
Charles Downing, E. P. Richardson,	3 00
Second, John B. Moore,	2 00
Hovey's Seedling, Benjamin G. Smith,	3 00
Second, E. P. Richardson,	2 00
Jenny Lind, E. P. Richardson,	3 00
Jucunda, E. W. Wood,	3 00
Lady of the Lake, John B. Moore,	3 00
President Wilder, Horace Eaton,	3 00
Second, John B. Moore,	2 00
Seth Boyden (No. 30), Marshall P. Wilder,	3 00
Second, Horace Eaton,	2 00
Triomphe de Gand, Charles Garfield,	3 00
Cherries. — Four varieties, two quarts each, C. E. Grant,	5 00
Second, Aaron D. Capen,	4 00
Two quarts of any variety, J. B. Loomis, fine Coe's Transparent,	3 00
Second, Thomas S. Lockwood, " "	2 00
Grapes. — Two bunches of any variety, Cephas H. Brackett, Black Hamburg,	4 00

Gratuities: —

Cephas H. Brackett, collection of Foreign Grapes,	2 00
Warren Fenno, Belle and Monarch of the West Strawberries,	2 00
E. P. Richardson, Champion Strawberries,	1 00
John B. Moore, collection of "	3 00
Hovey & Co., " "	3 00
Horace Eaton, Strawberries,	1 00

June 29.

Gratuities: —

J. B. Loomis, Cherries,	1 00
Warren Fenno, Strawberries,	1 00
Benjamin G. Smith, "	2 00
Charles Garfield, "	1 00
E. P. Richardson, "	1 00

July 6.

Cherries. — Two quarts, Thomas S. Lockwood, Coe's Transparent, $3 00
Second, Horace Partridge, Black Tartarian, ... 1 00
Strawberries. — Two quarts of any late variety, John B. Moore, Belle, ... 3 00
Second, Marshall P. Wilder, Abundant, ... 2 00

Gratuities: —

E. P. Richardson, Kentucky Strawberries, ... 1 00
C. E. Grant, Cherries, ... 1 00
W. K. Wood, collection of Currants, ... 2 00
M. W. Chadbourne, " 1 00
E. W. Mitchell, " 1 00
Warren Fenno, Black Cap Raspberries, ... 1 00
J. C. Keating, Mulberries, ... 1 00
C. D. Kingman, Peaches, ... 1 00
Cephas H. Brackett, collection of Foreign Grapes, . . . 2 00

July 13.

Raspberries. — Two quarts, Warren Fenno, Saunders, . . . 3 00
Second, E. P. Roe, Pride of the Hudson, ... 2 00
Third, W. Doran & Son, Franconia, ... 1 00
Currants. — Four quarts of a red variety, W. K. Wood, Versaillaise, 3 00
Second, W. Doran & Son, Versaillaise, ... 2 00
Third, Benjamin G. Smith, " 1 00
Four quarts of a white variety, E. P. Roe, White Grape, . . 3 00
Second, Benjamin G. Smith, Transparent, ... 2 00

Gratuities: —

Warren Fenno, Cherries, ... 1 00
E. W. Mitchell, Currants, ... 1 00
J. S. Richards, " 1 00
Mrs. E. M. Gill, " and Raspberries, ... 1 00
Charles Garfield, " " 1 00
Cephas H. Brackett, Black Hamburg Grapes, ... 1 00
Benjamin G. Smith, for the introduction of *Amelanchier Canadensis*, var. *oblongifolia*, or Dwarf June Berry, the Society's Silver Medal.

July 20.

Raspberries. — Not less than four varieties, one quart each, E. P. Roe (eight varieties), ... 5 00
Second, Joseph Clark, ... 3 00
Two quarts, any variety, E. P. Roe, Pride of the Hudson, . . 3 00
Second, Warren Fenno, Saunders, ... 2 00
Third, W. K. Wood, Clarke, ... 1 00

Currants. — Not less than four varieties, two quarts each, Warren Fenno, ... $5 00
Second, W. Doran & Son, ... 3 00
Four quarts, any variety, W. Doran & Son, Versaillaise, . . 3 00
Second, Mrs. E. M. Gill, Versaillaise, ... 2 00
Third, C. E. Grant, ... 1 00
Blackberries. — Two quarts, E. P. Roe, Early Wilson, . . . 3 00
Gooseberries. — Two quarts, Horace Eaton, Downing, . . . 3 00
Second, B. G. Smith, Downing, ... 2 00
Third, Charles Garfield, Royal George, ... 1 00

July 27.

Blackberries. — Two quarts, James Nugent, Dorchester, . . 3 00
Second, B. C. Vose, Dorchester, ... 2 00
Pears. — Doyenne d'Été, W. P. Walker, ... 3 00
Second, Asa Bullard, ... 2 00

Gratuities : —

D. F. Hayes, Delaware Grapes, grown under glass, ... 1 00
B. G. Smith, Foreign Gooseberries, two varieties, ... 2 00
Charles Garfield, collection of Gooseberries and Raspberries, . . 1 00
C. M. Atkinson, Black Currants, ... 1 00

August 3.

Pears. — Beurre Giffard, Warren Heustis, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Benjamin G. Smith, ... 1 00
Apples. — Early Harvest, the second prize to Benjamin G. Smith, 2 00
Large Yellow Bough, G. M. Mellen, ... 3 00
Second, Lewis Slack, ... 2 00

Gratuities : —

T. Putnam Symonds, Alexander Peaches, ... 1 00
J. H. Woodford, Red Astrachan Apples, ... 1 00
Samuel Hartwell, Apples, ... 1 00
N. B. White, " 1 00
Charles Garfield, Blackberries and Raspberries, ... 1 00
James Nugent, very fine Dorchester Blackberries, ... 1 00
J. C. Weld, Chinese Pears, grown in Georgia, ... 1 00

August 10.

Gooseberries. — Two quarts of Foreign, Benjamin G. Smith, Bangup, ... 3 00
Second, Benjamin G. Smith, Wellington's Glory, ... 2 00

Apples. — Early Harvest, D. F. Hayes,	$3 00
Large Yellow Bough, Mrs. B. B. Davis,	3 00
Second, Edwin Fletcher,	2 00
Red Astrachan, E. W. Wood,	3 00
Second, John Cummings,	2 00
Williams, Warren Heustis,	3 00
Second, John Cummings,	2 00
Any other early variety, T. M. Davis, Summer Harvey,	3 00
Second, John Cummings, Tetofsky,	2 00
Pears. — Any early variety, George Frost, for Suprême de Quimper,	3 00
Second, Warren Heustis, Beurre Giffard,	2 00

Gratuities:—

Edwin Fletcher, Apples,	1 00
Samuel Hartwell, Apples,	1 00
Mrs. H. V. Draper, Peach Plums,	1 00

August 17.

Pears. — Clapp's Favorite, F. & L. Clapp,	3 00
Second, Charles L. Bird,	2 00
Third, Mrs. E. M. Gill,	1 00

Gratuities:—

C. D. Kingman, cold house Peaches,	2 00
Mrs. H. V. Draper, Washington Plums,	1 00
C. M. Atkinson, collection of Foreign Grapes,	5 00
Benjamin G. Smith, Apples,	1 00
John Cummings, "	1 00
Samuel Hartwell, "	1 00
Warren Heustis, " and Pears,	1 00
J. T. Foster, " and Peaches,	1 00
Warren Fenno, " "	1 00

August 24.

Pears. — Bartlett, Alexander Dickinson,	3 00
Second, Charles F. Curtis,	2 00
Third, T. M. Davis,	1 00
Tyson, A. S. McIntosh,	3 00
Second, Warren Fenno,	2 00
Third, Samuel McIntosh,	1 00
Plums. — Any variety, Hovey & Co., Bradshaw,	3 00
Second, Daniel Tucker, "	2 00
Third, Edwin A. Hall, Prince's Imperial Gage,	1 00
Peaches. — Any variety, Horace Partridge,	3 00
Second, J. T. Foster, Laura,	2 00

Gratuities:—

Amos Bates, Plums,	$1 00
Joseph Gardner, Washington Plums,	1 00
J. E. Hodgkins, Peaches,	1 00
Robert Manning, Dearborn's Seedling Pears,	1 00
Benjamin G. Smith, White Chasselas Grapes,	1 00
John Cummings, collection of Apples,	2 00
Samuel Hartwell, Apples,	1 00
John B. Moore, "	1 00

AUGUST 31.

APPLES. — Any variety, Samuel Hartwell, Gravenstein,	3 00
Second, John Cummings, Garden Royal,	2 00
Third, Charles Bird, Gravenstein,	1 00
PEARS. — Bartlett, T. M. Davis,	3 00
Second, C. N. Brackett,	2 00
Third, A. S. McIntosh,	1 00
Any other variety, Joseph S. Chase, Clapp's Favorite,	3 00
Second, Benjamin G. Smith, Duchesse de Berry,	2 00
Third, George T. Oakes, Clapp's Favorite,	1 00
PLUMS. — Collection of not less than four varieties, Horace Eaton,	4 00
Dish of any variety, Hovey & Co., Bradshaw,	3 00
Second, J. T. Foster, Prince's Imperial Gage,	2 00
Third, Horace Eaton, Bradshaw,	1 00
NATIVE GRAPES. — Six bunches of any early variety, John B. Moore, Moore's Early,	3 00

Gratuities:—

A. S. McIntosh, Crawford's Early Peaches,	1 00
Warren Fenno, Apples and Peaches,	1 00
E. Fred Washburn, Seedling Peaches,	1 00
J. D. Hovey, Seedling Peaches,	1 00
Horace Partridge, Peaches and Grapes,	1 00
C. H. Johnson, Seedling Peaches,	1 00
N. D. Harrington, large and very fine Crawford's Early Peaches,	2 00
John Cummings, Apples,	1 00
Samuel Hartwell "	1 00
Mrs. E. S. Joyce, Figs,	1 00
Edwin Fletcher, Apples,	1 00
J. L. D. Sullivan, White Seedling Nectarines,	1 00

SEPTEMBER 7.

APPLES. — Foundling, Leonard W. Weston, ... $3 00
Second, Edwin Fletcher, ... 2 00
Third, Samuel Hartwell, ... 1 00
Gravenstein, Samuel Hartwell, ... 3 00
Second, M. H. Merriam, ... 2 00
Third, Charles Bird, ... 1 00
Porter, George Hill, ... 3 00
Second, Edwin Fletcher, ... 2 00
Third, John Cummings, ... 1 00
Any other variety, C. N. Brackett, Alexander, ... 3 00
Second, John Cummings, Garden Royal, ... 2 00
Third, Charles Stearns, Dutch Codlin, ... 1 00
PEARS. — Andrews, Charles F. Curtis, ... 3 00
Second, Horace Partridge, ... 2 00
Third, George Frost, ... 1 00
Belle Lucrative, George T. Oakes, ... 3 00
Second, Horace Partridge, ... 2 00
Third, Charles Bird, ... 1 00
Doyenne Boussock, E. W. Wood, ... 3 00
Second, C. N. Brackett, ... 2 00
Third, George Frost, ... 1 00
Any other variety, J. V. Wellington, Bartlett, ... 3 00
Second, Alexander Dickinson, " 2 00
Third, A. S. McIntosh, " 1 00
NATIVE GRAPES. — Six bunches, any early variety, John B. Moore, Moore's Early, ... 3 00
Second, J. W. Talbot, Cottage, ... 3 00
Third, Benjamin G. Smith, Moore's Early, ... 1 00
PEACHES. — Any variety, Horace Eaton, Oldmixon Freestone, . . 3 00
Second, Henry Souther, Crawford's Early, ... 2 00
Third, George T. Oakes, Foster, ... 1 00

Gratuities:—

Stiles Frost, Plums, ... 1 00
Horace Partridge, Macready's Early Grapes, ... 1 00
Mrs. E. S. Joyce, Brown Turkey Figs, ... 1 00
Caleb Bates, Peaches, ... 2 00
Samuel Hartwell, Apples, ... 1 00
Edwin Fletcher, " 1 00
J. T. Foster, Peaches and Apples, ... 1 00
Warren Fenno, Pears, ... 1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

APPLES. — American Beauty, Edwin Fletcher,	$3 00
Baldwin, Samuel Hartwell,	3 00
Second, John Cummings,	2 00
Third, Edwin Fletcher,	1 00
Cogswell, C. N. Brackett,	3 00
Second, Asa Clement,	2 00
Danvers Winter Sweet, John Cummings,	3 00
Second, Warren Fenno,	2 00
Duchess of Oldenburgh, O. B. Hadwen,	3 00
Second, George Frost,	2 00
Dutch Codlin, F. & L. Clapp,	3 00
Second, A. S. McIntosh,	2 00
Fall Orange, or Holden Pippin, Asa Clement,	3 00
Second, George Winn,	2 00
Third, Edward Sumner,	1 00
Fameuse, Benjamin G. Smith,	3 00
Second, Asa Clement,	2 00
Foundling, Edwin Fletcher,	3 00
Second, Asa Clement,	2 00
Third, O. B. Hadwen,	1 00
Garden Royal, John Cummings,	3 00
Second, Edwin Fletcher,	2 00
Golden Russet, Warren Fenno,	3 00
Gravenstein, Samuel Hartwell,	3 00
Second, F. & L. Clapp,	2 00
Third, William Mackintosh,	1 00
Hubbardston Nonsuch, C. N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Third, Walter Russell,	1 00
Hunt Russet, Samuel Hartwell,	3 00
Second, John Cummings,	2 00
Third, John B. Moore,	1 00
King of Tompkins County, Asa Clement,	3 00
Second, Edwin Fletcher,	2 00
Third, C. N. Brackett,	1 00
Ladies' Sweet, Edwin Fletcher,	3 00
Second, Asa Clement,	2 00
Leicester Sweet, Asa Clement,	3 00
Second, O. B. Hadwen,	2 00
Lyscom, Samuel Hartwell,	3 00
Second, Asa Clement,	2 00
Maiden's Blush, John Cummings,	3 00
Second, Warren Fenno,	2 00

Minister, William T. Hall,	$3 00
Second, Asa Clement,	2 00
Mother, John Cummings,	3 00
Second, Edwin Fletcher,	2 00
Northern Spy, Amos Bates,	3 00
Second, John B. Moore,	2 00
Third, Asa Clement,	1 00
Porter, Edward Sumner,	3 00
Second, A. S. McIntosh,	2 00
Third, John Cummings,	1 00
Pumpkin Sweet, George W. Stevens,	3 00
Second, Asa Clement,	2 00
Rhode Island Greening, Horace Eaton,	3 00
Second, E. W. Wood,	2 00
Third, John Cummings,	1 00
Roxbury Russet, Edward Sumner,	3 00
Second, John L. De Wolf,	2 00
Third, Warren Heustis,	1 00
Washington Strawberry, J. C. Park,	3 00
Second, F. & L. Clapp,	2 00
Yellow Bellflower, Asa Clement,	3 00
Second, Joseph H. Bell,	2 00
Crab Apples. — Hyslop, E. W. Bettinson,	2 00
Transcendent, Horace Eaton,	2 00
Second, Horace Partridge,	1 00
Pears. — Andrews, Horace Partridge,	3 00
Second, S. P. Langmaid,	2 00
Third, A. McDermott,	1 00
Bartlett, S. P. Langmaid,	3 00
Second, J. F. Nickerson,	2 00
Third, W. S. Janvrin,	1 00
Belle Lucrative, Isaac Oliver,	3 00
Second, Horace Eaton,	2 00
Third, W. P. Walker,	1 00
Beurre d'Anjou, S. P. Langmaid,	3 00
Second, W. S. Janvrin,	2 00
Third, William T. Hall,	1 00
Beurre Bosc, S. P. Langmaid,	3 00
Second, George S. Curtis,	2 00
Third, J. C. Park,	1 00
Beurre Clairgeau, Warren Fenno,	3 00
Second, Horace Partridge,	2 00
Third, W. S. Janvrin,	1 00
Beurre Diel, E. L. Draper,	3 00
Second, J. V. Wellington,	2 00
Beurre Gris d'Hiver Nouveau, Warren Fenno,	3 00
Second, E. W. Wood,	2 00

Beurre Hardy, Jesse Haley,	$3 00
Second, Charles F. Curtis,	2 00
Third, Warren Fenno,	1 00
Beurre Langelier, Amos Bates,	3 00
Second, Marshall P. Wilder,	2 00
Beurre Superfin, Lewis Slack,	3 00
Second, John L. Bird,	2 00
Third, T. M. Davis,	1 00
Buffum, J. F. Nickerson,	3 00
Second, John L. Bird,	2 00
Dana's Hovey, A. S. McIntosh,	3 00
Second, Alexander Dickinson,	2 00
Third, Benjamin G. Smith,	1 00
De Tongres, J. C. Park,	3 00
Second, John L. Bird,	2 00
Third, T. M. Davis,	1 00
Doyenne Boussock, Jacob Eaton,	3 00
Second, Marshall P. Wilder,	2 00
Third, E. W. Wood,	1 00
Doyenne du Comice, J. C. Park,	3 00
Second, W. P. Walker,	2 00
Third, Warren Fenno,	1 00
Duchesse d'Angouleme, Alexander Dickinson,	3 00
Second, John McClure,	2 00
Third, J. F. Nickerson,	1 00
Fulton, J. C. Park,	3 00
Second, John L. Bird,	2 00
Glout Morceau, J. F. Nickerson,	3 00
Second, Warren Fenno,	2 00
Third, John L. De Wolf,	1 00
Goodale, C. E. Grant,	3 00
Second, Alexander Dickinson,	2 00
Howell, Jesse Haley,	3 00
Second, W. S. Janvrin,	2 00
Third, Warren Fenno,	1 00
Lawrence, S. P. Langmaid,	3 00
Second, W. S. Janvrin,	2 00
Third, Warren Fenno,	1 00
Louise Bonne of Jersey, W. S. Janvrin,	3 00
Second, S. P. Langmaid,	2 00
Third, Alexander Dickinson,	1 00
Marie Louise, Alexander Dickinson,	3 00
Second, George Frost,	2 00
Third, John L. De Wolf,	1 00
Merriam, John L. De Wolf,	3 00
Second, A. S. McIntosh,	2 00
Third, Charles F. Curtis,	1 00

Mount Vernon, Walker & Co.,	$3 00
Second, Charles Bird,	2 00
Onondaga, or Swan's Orange, A. McDermott,	3 00
Second, W. P. Walker,	2 00
Third, Charles Bird,	1 00
Paradis d'Automne, W. S. Plimpton,	3 00
Second, John L. Bird,	2 00
Third, Marshall P. Wilder,	1 00
Seckel, G. M. Mellen,	3 00
Second, John L. Bird,	2 00
Third, George D. Putnam,	1 00
Sheldon, Mrs. M. T. Goddard,	3 00
Second, Charles F. Curtis,	2 00
Third, William A. Crafts,	1 00
Souvenir du Congrès, Warren Fenno,	3 00
Second, Marshall P. Wilder,	2 00
St. Michael Archangel, T. M. Davis,	3 00
Second, Walker & Co.,	2 00
Third, Jesse Haley,	1 00
Urbaniste, Jesse Haley,	3 00
Second, John L. De Wolf,	2 00
Third, Isaac Oliver,	1 00
Vicar of Winkfield, William T. Hall,	3 00
Second, W. S. Janvrin,	2 00
Winter Nelis, John L. Bird,	3 00
Second, Warren Fenno,	2 00
Third, W. P. Walker,	1 00
PEACHES. — Dish of any variety, J. L. D. Sullivan, for Crawford's Early,	3 00
Second, Mrs. M. T. Goddard,	2 00
Orchard House Culture, J. S. Amory, for Crawford's Late,	4 00
Second, John Falconer, for Rivers' Lord Palmerston,	3 00
NECTARINES. — Any variety, John Falconer, Rivers' Victoria,	3 00
Second, John Falconer, Rivers' Prince of Wales,	2 00
PLUMS. — Collection, not less than four varieties, Horace Eaton,	4 00
Dish of any variety, Mrs. H. V. Draper, Washington,	3 00
Second, John Falconer, Rivers' Sultan,	2 00
Third, John Falconer, Jefferson,	1 00
NATIVE GRAPES. — Six bunches of Concord, W. Doran & Son,	3 00
Second, George Hill,	2 00
Third, J. W. Talbot,	1 00
Creveling, S. G. Damon,	3 00
Delaware, Joseph S. Chase,	3 00
Second, Augustus Torrey,	2 00
Third, Warren Fenno,	1 00
Hartford, M. Darling, Jr.,	3 00
Second, J. W. Talbot,	2 00

Third, T. M. Davis,	$1 00
Any other early variety, Benjamin G. Smith,	3 00
Second, John B. Moore,	2 00
Third, S. G. Damon,	1 00
Foreign Grapes.—Six varieties, two bunches each, A. W. Nickerson,	10 00
Second, Benjamin G. Smith,	8 00
Third, Horace Partridge,	4 00
Four varieties, two bunches each, Henry C. Cooke,	8 00
Two varieties, two bunches each, Stiles Frost,	4 00
Third prize, Benjamin G. Smith,	2 00
Two bunches of any Black Grape, C. D. Kingman, Black Hamburg,	4 00
Second, John Falconer, Gros Maroc,	3 00
Third, Stiles Frost, Black Hamburg,	2 00
Two bunches of any White Grape, C. D. Kingman,	4 00

Gratuities:—

E. W. Wood, large Blue Pearmain Apples,	1 00
Edward Sumner, Morrison's Red "	1 00
J. C. Park, Alexander "	1 00
O. B. Hadwen, Mexico "	1 00
John B. Moore, collection of "	3 00
Samuel Hartwell, " "	3 00
Edwin Fletcher, " "	3 00
Josiah Newhall, "	2 00
A. Hatch, "	2 00
J. W. Talbot, "	1 00
C. N. Brackett, "	1 00
Abraham B. Shedd, "	1 00
S. N. Gaut, "	1 00
Benjamin G. Smith, Apples and Pears,	3 00
John Cummings, " "	3 00
Warren Fenno, " "	3 00
Francis B. Hayes, " "	2 00
Benjamin F. Hunt, Jr., Pears,	2 00
S. N. Gaut, "	2 00
James Cruickshanks, "	2 00
Horace Partridge, "	1 00
C. E. Grant, "	1 00
M. W. Chadbourne, "	1 00
John B. Moore, "	1 00
J. S. Richards, "	1 00
John Falconer, Pears, Apples, and Peaches,	2 00
Mrs. Lorenzo Sabine, Seedling Peaches,	1 00
Benjamin G. Smith, Foreign Grapes,	1 00
James H. Ricketts, collection of Seedling Grapes,	3 00

SEPTEMBER 27.

Gratuity: —

C. H. Johnson, fine Seedling Peaches, ... $1 00

OCTOBER 5.

PEARS. — Beurre Bosc, W. H. M. Austin, ... 3 00
Second, T. M. Davis, ... 2 00
Third, W. S. Janvrin, ... 1 00
Beurre Clairgeau, Warren Fenno, ... 3 00
Second, John McClure, ... 2 00
Third, Horace Partridge, ... 1 00
Beurre Diel, Walker & Co., ... 3 00
Second, Edwin A. Hall, ... 2 00
Third, T. M. Davis, ... 1 00
Doyenne du Comice, W. S. Janvrin, ... 3 00
Second, Walker & Co., ... 2 00
Third, John McClure, ... 1 00
Duchesse d'Angouleme, S. G. Damon, ... 3 00
Second, John McClure, ... 2 00
Third, Edwin A. Hall, ... 1 00
Louise Bonne of Jersey, T. M. Davis, ... 3 00
Second, W. T. Hall, ... 2 00
Third, Edwin A. Hall, ... 1 00
Urbaniste, Walker & Co., ... 3 00
Second, S. P. Langmaid, ... 2 00
Third, John L. Bird, ... 1 00
APPLES. — Fall Orange, or Holden Pippin, Asa Clement, . . . 3 00
Second, Edwin Fletcher, ... 2 00
Gravenstein, Asa Clement, ... 3 00
Second, Samuel Hartwell, ... 2 00
Mother, John Cummings, ... 3 00
Second, Edwin Fletcher, ... 2 00
Porter, A. S. McIntosh, ... 3 00
Second, John Cummings, ... 2 00
NATIVE GRAPES. — Six bunches of Agawam, C. F. Holt, . . 3 00
Second, Warren Fenno, ... 2 00
Concord, W. Doran & Son, ... 3 00
Second, Cephas H. Brackett, ... 2 00
Third, Moses Darling, Jr., ... 1 00
Diana, M. H. Merriam, ... 3 00
Second, Isaac P. Langworthy, ... 2 00
Isabella, J. V. Wellington, ... 3 00
Second, C. E. Grant, ... 2 00
Massasoit, Cephas H. Brackett, ... 3 00
Wilder, Cephas H. Brackett, ... 3 00
Second, Joseph S. Chase, ... 2 00

Foreign Grapes. — Three varieties, two bunches each, E. W. Wood,	$5 00
Second, H. C. Cooke,	4 00
Two bunches of any variety, E. W. Wood, Black Hamburg,	3 00
Second, Stiles Frost,	2 00
Quinces. — Any variety, W. S. Janvrin,	3 00
Second, Benjamin G. Smith,	2 00
Third, Horace Eaton,	1 00

Gratuities : —

Horace Partridge, Grapes and Peaches,	2 00
Benjamin G. Smith, Foreign and Native Grapes,	2 00
C. E. Grant, Grapes,	1 00
Edwin Fletcher, Apples,	1 00
Benjamin Cushing, Clapp's Seedling Pear, Harris,	1 00
B. F. Wing, fine Marie Louise Pears,	1 00
John McClure, very fine Sheldon Pears,	1 00
Benjamin G. Smith, Apples and Pears,	1 00

October 26.

Gratuity : —

F. & L. Clapp, collection of Seedling Pears,	2 00

November 9.

Pears. — Beurre d'Anjou, W. S. Janvrin,	3 00
Second, John C. Park,	2 00
Third, Warren Fenno,	1 00
Dana's Hovey, A. S. McIntosh,	3 00
Second, Alexander Dickinson,	2 00
Third, Hovey & Co.,	1 00
Lawrence, S. P. Langmaid,	3 00
Second, David B. Flint,	2 00
Third, Jesse Haley,	1 00
Winter Nelis, John McClure,	3 00
Second, T. M. Davis,	2 00
Third, Alexander Dickinson,	1 00

French Premiums

Apples. — Baldwin, C. C. Shaw,	3 00
Second, Leonard W. Weston,	2 00
Hubbardston Nonsuch, M. W. Chadbourne,	3 00
Second, Walter Russell,	2 00

Hunt Russet, Asa Clement,	$3 00
Second, John B. Moore,	2 00
King of Tompkins County, Edwin Fletcher,	3 00
Second, Asa Clement,	2 00
Northern Spy, W. T. Hall,	3 00
Second, C. C. Shaw,	2 00
Rhode Island Greening, Edwin Fletcher,	3 00
Second, Horace Eaton,	2 00
Roxbury Russet, Cephas H. Brackett,	3 00
Second, Mrs. C. N. S. Horner,	2 00

REPORT

OF THE

Committee on Vegetables,

FOR THE YEAR 1878.

By C. N. BRACKETT, Chairman.

The past season has been an unusually favorable one for the various productions of the vegetable garden. The crops have not only been abundant, but have, with few exceptions, been above the general average in quality.

Seldom have we seen finer or better grown specimens than have been placed upon our tables at the weekly exhibitions the past season. We note with great pleasure the gradual improvement in the quality of the vegetables offered for our inspection from year to year, and are led to infer that more attention is being paid at the present time than formerly, to the great importance of pure and reliable seed, as the starting point to success and profit with the intelligent cultivator. Careful culture, and the employment of the requisite amount of proper fertilizers, are, of course, necessary to the perfection of a crop; and by rendering plants healthy and vigorous, and enabling them to withstand the vicissitudes of temperature in a climate like ours, will do much to insure it, but they will not wholly avail, if the cultivator allows himself to start with inferior or even *doubtful* seed; when his harvest comes, disappointment and loss are as sure to follow as day to follow night. This is a matter of great importance, too often overlooked, and which cannot be too frequently impressed upon cultivators, if they desire to promote what most aim at in life, — their own pecuniary interests.

The exhibitions of forced vegetables during the earlier portion of the year, from January to April, were the most meagre we remember to have seen for several years. The improvement hoped for at these exhibitions in a former report has not been realized. With the exception of a few fine specimens of Tennisball Lettuce from George F. Stone, J. B. Moore, Josiah Crosby, and Walter Russell, and Cucumbers and Rhubarb from Cephas H. Brackett, there was nothing offered worthy of special mention until the Azalea Exhibition, which occurred April 6th. From this time up to the Annual Exhibition, in September, the weekly shows were generally very fine. Very few inferior specimens were to be found on our tables during the entire season, which is more than can be said of some former years, and is certainly creditable to our contributors.

A few vegetables, new to your Committee, have been shown for the first time on our tables the past season, prominent among which was a new variety of Rhubarb, exhibited by John C. Hovey, June 1st, and called the Monarch. The specimens shown were very large and handsome, and received the first prize.

July 13th Samuel G. Stone exhibited a new variety of Sweet Corn, under the name of Early Minnesota. It is a small but very early variety, and said to be of good quality, and may, on account of its earliness, prove of value for the kitchen garden, although we should consider it rather too small for a profitable market variety.

On the same day C. M. Atkinson showed a very handsome new variety of Pea, called Carter's Challenger. Your Committee were very much pleased with its appearance, and hope to see it in other collections the coming year.

June 15th M. W. Chadbourne showed a very fine collection of Peas, consisting of the following varieties, viz.: Carter's First Crop, Premium Little Gem, and Alpha.

June 26th the first and second prizes for Peas were awarded for Alpha, and the third for William First. In addition to the above named varieties, we also noticed the following sorts, which were shown from time to time: Hill's Early, by Josiah Crosby; Caractacus, by Samuel Hartwell; Kentish Invicta, by S. G. Stone; McLean's Advancer, by Walter Russell and others; and Commander-in-Chief, by M. W. Chadbourne. The first prize for Lima Beans was again awarded to Benjamin G. Smith, who seems

to distance all competitors. Mr. Smith also carried off the first prize for Limas at the Annual Exhibition. His specimens were very fine; he has got the *pole*, and evidently intends to keep it, — filled with his splendid specimens, in readiness to sweep the board of all the first prizes in the future.

The display at the Annual Exhibition, although much smaller than on many previous occasions, was, on the whole, satisfactory in its character. The falling off at this exhibition is accounted for by the fact that several, who have heretofore been among our largest and most constant contributors to these exhibitions for many years, failed, for some cause, to put in an appearance. This was, of course, to be regretted, as it is always desirable at our annual shows to have all the space devoted to this department well filled. Although lacking in quantity, in comparison with the previous year, the deficiency was more than made up by the excellence of the specimens shown. It was the general remark that root crops were the best and most perfect ever shown at any exhibition of the Society.

The show of Tomatoes was, considering the lateness of the season, remarkably full and fine. There were eighty different dishes, representing all the leading varieties. The collection of John Cummings was the largest and best. His specimens of Boston Market, Gen. Grant, Emery, and Paragon, were fully up to the standard, and were much admired by all who entered the hall. Samuel Hartwell and J. J. H. Gregory, each showed a large collection of very fine specimens. The first prizes for the best three varieties, and best single dishes, were all won by Mr. Cummings.

The display of Potatoes, although not large, was unusually fine. The specimens shown were uniform in size, smooth, and well grown. The whole number of dishes was twenty-six, prominent among which were the Early Rose, Snow Flake, Early Vermont, Burbank's Seedling, Early Ohio, and Dunmore's Seedling. The prize for the best collection of new seedlings was not awarded, none being exhibited.

The Squash family was also well represented at this exhibition. The specimens of the different varieties showed a nearer approach to the desired standard of excellence than has been the case at any former show

Cauliflowers were not up to the usual standard at this exhibition, although some excellent specimens were shown later in the season.

We are indebted to I. P. Dickinson, of Springfield, Mass., for the best collection of Watermelons ever seen in our hall. They were noble specimens, weighing upwards of fifty pounds each, and were much admired. Mr. Dickinson swept the board, taking all the prizes, first, second, and third, and would have taken a fourth, had one been offered. Greenflesh melons, owing to the lateness of the season, were not up to the average; most of the specimens were small, somewhat spotted, and not equal to those seen at the weekly exhibitions during the month of August.

Before concluding our report we would call the attention of contributors to important changes in the Schedule of Prizes for 1879. It will be noticed, on referring to the Schedule, that it has been found necessary to make a still further reduction in the amount appropriated for prizes and gratuities, in this department, for the coming year. Also, that the number of prize exhibitions has been reduced to five; the first in March, the second and third in June, the fourth — the Annual Exhibition — in September, and the fifth in November. The amount placed at the disposal of this Committee is $500, which sum has been divided in such manner as to make each of these exhibitions as full and interesting as possible. The prize list for the Annual Exhibition in September remains much the same as this year. One hundred dollars of the appropriation is reserved, to be awarded in gratuities for such worthy objects as may be exhibited during the interval from June to September, when no prizes are offered.

There has been a considerable falling off in the number of contributors during the past year, as compared with the two previous years. In 1876 premiums and gratuities were awarded to sixty-seven different persons; in 1877 to sixty-two, and in 1878 to fifty-four.

The amount appropriated for Prizes and Gratuities the past year, was		$750 00
Awarded in Prizes,	$503 00	
Awarded in Gratuities,	167 00	
Total amount of awards,		670 00
Balance unexpended,		$80 00

The annexed list shows the Prizes and Gratuities awarded by your Committee during the year.

All of which is respectfully submitted.

C. N. Brackett,
Walter Russell,
George W. Pierce,
John Fillebrown,
Josiah Crosby,
Anthony Hatch,
Samuel Hartwell,
} *Committee on Vegetables.*

PRIZES AND GRATUITIES FOR VEGETABLES.

JANUARY 19.

Gratuity : —

George F. Stone, Lettuce and Dandelions, ... $1 00

JANUARY 26.

Gratuity : —

John B. Moore, Lettuce, ... 1 00

FEBRUARY 2.

Gratuity : —

J. B. Moore, Lettuce, ... 1 00

FEBRUARY 9.

Gratuity : —

J. B. Moore, Lettuce, ... 1 00

FEBRUARY 16.

Gratuity : —

Cephas H. Brackett, Cucumbers and Rhubarb, ... 2 00

FEBRUARY 23.

Gratuities : —

J. H. Bell, collection, ... 2 00
J. B. Moore, Lettuce, ... 1 00

MARCH 2.

Gratuities : —

J. B. Moore, Lettuce, ... 1 00
George Hill, " 1 00
C. H. Brackett, Rhubarb and Cucumbers, ... 2 00
Josiah Crosby, collection, ... 2 00
C. B. Gardiner, Mushrooms, ... 1 00

MARCH 9.

Gratuity : —

Josiah Crosby, collection, ... 2 00

March 16.

Gratuity : —

Walter Russell, collection, ... $2 00

AZALEA EXHIBITION.

April 6.

Cucumbers. — Pair of White Spine, C. H. Brackett, . . . 3 00
Lettuce. — Four heads of Tennisball, George F. Stone, . . . 3 00
Second, Josiah Crosby, ... 2 00
Third, Charles Garfield, ... 1 00
Radishes. — Four bunches of Turnip Rooted, J. H. Bell, . . 3 00
Rhubarb. — Twelve stalks, J. H. Bell, ... 3 00
Parsley. — Two quarts, " 3 00
Mushrooms. — Twenty-four specimens, C. B. Gardiner, . . . 3 00

Gratuity : —

A. S. McIntosh, Artichokes, ... 1 00

April 20.

Gratuity : —

Charles Garfield, Lettuce, ... 1 00

April 27.

Gratuities : —

M. W. Chadbourne, Rhubarb, ... 2 00
George Dorr, " 1 00

May 4.

Gratuities : —

A. S. McIntosh, Artichokes, ... 1 00
J. B. Moore, Asparagus, ... 2 00
Charles Garfield, Lettuce, ... 1 00

May 11.

Gratuities : —

J. B. Moore, Asparagus, ... 2 00
Samuel Hartwell, Asparagus and Rhubarb, ... 2 00

May 25.

Gratuities : —

Walter Russell, Radishes, ... 1 00
Samuel Hartwell, collection, ... 2 00
George F. Stone, Lettuce, ... 1 00

JUNE 1.

ASPARAGUS. — Four bunches, J. B. Moore, ... $3 00
Second, Samuel Hartwell, ... 2 00
Third, L. W. Weston, ... 1 00
CUCUMBERS. — Pair, Josiah Crosby, ... 3 00
Second, J. H. Bell, ... 2 00
RHUBARB. — Twelve stalks, J. C. Hovey, Monarch, ... 3 00
Second, Samuel Hartwell, Victoria, ... 2 00
Third, A. D. Capen, Linnæus, ... 1 00
RADISHES. — Four bunches of Long Scarlet, Josiah Crosby, . . 3 00
LETTUCE. — Four heads, J. B. Moore, ... 3 00
Second, Josiah Crosby, ... 2 00
Third, George F. Stone, ... 1 00
CARROTS. — Twelve, Josiah Crosby, ... 3 00
BEETS. — Twelve, J. Crosby, ... 3 00

Gratuity: —

C. H. Brackett, Tomatoes, ... 1 00

JUNE 15.

Gratuities: —

M. W. Chadbourne, collection of Peas, ... 2 00
Samuel Hartwell, Peas, ... 1 00

JUNE 19.

Gratuities: —

M. W. Chadbourne, three varieties of Peas, ... 2 00
W. C. Child, collection of " 2 00
Samuel G. Stone, Kentish Invicta " 1 00
Samuel Hartwell, Caractacus " 1 00
C. E. Grant, Carter's First Crop " 1 00
Josiah Crosby, Hill's Early " 1 00
C. H. Brackett, White Spine Cucumbers, ... 1 00
George Hill, Dewing's Early Beets, ... 1 00
J. B. Moore, Lettuce, ... 1 00
Josiah Crosby, collection of seven varieties of Vegetables, . . 5 00

STRAWBERRY SHOW.

JUNE 26.

PEAS. — One peck, M. W. Chadbourne, Alpha, ... 3 00
Second, J. H. Bell, Alpha, ... 2 00
Third, M. W. Chadbourne, William First, ... 1 00

Beets. — Twelve Turnip Rooted, George Hill, Dewing's,	$3 00
Second, Walter Russell, "	2 00
Egyptian, J. Crosby,	3 00
Second, George Hill,	2 00
Third, Anthony Hatch,	1 00
Cucumbers. — Pair of White Spine, Cephas H. Brackett,	3 00
Second, George Hill,	2 00
Third, Walter Russell,	1 00
Lettuce. — Any variety, George Hill,	3 00
Second, Walter Russell,	2 00
Third, Anthony Hatch,	1 00
Onions. — Twelve, Josiah Crosby,	3 00
Carrots. — Twelve Intermediate, J. Crosby,	3 00
Second, Walter Russell,	2 00

Gratuities: —

M. W. Chadbourne, Early Rose Potatoes,	2 00
C. D. Kingman, " " "	1 00
C. H. Brackett, Tomatoes,	1 00
Walter Russell, Cabbages and Radishes,	2 00
Josiah Crosby, " " Carrots,	2 00
C. E. Grant, Peas,	1 00

June 29.

Gratuity: —

M. W. Chadbourne, collection of Peas,	1 00

July 6.

Cranberry Beans. — One peck, Josiah Crosby,	3 00
Squashes. — Four Long Warted Summer, J. Crosby,	3 00
Second, George Hill,	2 00
Third, Walter Russell,	1 00
Peas. — One peck, J. B. Moore, Carter's Challenger,	3 00
Second, Walter Russell, Advancer,	2 00
Third, S. G. Stone, "	1 00
Onions. — Twelve, J. Crosby,	3 00
Potatoes. — One peck, S. G. Stone, Early Rose,	3 00
Second, G. M. Mellen, "	2 00
Cabbages. — Four, Josiah Crosby, Henderson,	3 00
Second, George Hill, "	2 00
Third, W. Russell, Wyman,	1 00

Gratuity: —

M. W. Chadbourne, Potatoes,	1 00

JULY 13.

POTATOES. — One peck, M. W. Chadbourne, Early Rose,	$3 00
Second, Horace Partridge, "	2 00
Gratuities: —	
Josiah Crosby, Cabbages,	2 00
C. M. Atkinson, Carter's Challenger Peas,	1 00
M. W. Chadbourne, "	1 00
Charles Garfield, Valentine Beans,	1 00
Samuel G. Stone, Minnesota Corn,	2 00
Francis B. Hayes, Lettuce,	1 00

JULY 20.

SWEET CORN. — Twelve ears, S. G. Stone, Early Minnesota,	3 00
Second. S. Hartwell, Narragansett,	2 00
Third, S. G. Stone, Crosby,	1 00
SQUASHES. — Four Marrow, J. Crosby,	3 00
CABBAGES. — Four Drumhead, J. Crosby,	3 00
TOMATOES. — Twelve, George W. Pierce, Emery,	3 00
Gratuities: —	
C. D. Kingman, Gen. Grant Tomatoes,	1 00
Mrs. E. M. Gill, Wax Beans,	1 00
George M. Mellen, " "	1 00

JULY 27.

TOMATOES. — Twelve, A. D. Capen,	3 00
SWEET CORN. — Twelve ears, J. Crosby,	3 00
Second, L. W. Weston,	2 00
Third, S. Hartwell,	1 00
Gratuities: —	
G. M. Mellen, Early Rose Potatoes,	1 00
W. H. Spooner, Golden Butter Beans,	1 00
Mrs. E. M. Gill, Horticultural Beans,	1 00
Francis B. Hayes, Cos Lettuce,	1 00

AUGUST 3.

SWEET CORN. — Twelve ears, Josiah Crosby,	3 00
Second, L. W. Weston,	2 00
Third, J. H. Bell,	1 00
SQUASHES. — Four Marrow, Josiah Crosby,	3 00
TOMATOES. — Twelve Gen. Grant, J. H. Bell,	3 00
Second, C. N. Brackett,	2 00

Boston Market, A. D. Capen,	$3 00
Second, M. W. Chadbourne,	2 00
Any other variety, Charles Garfield, Trophy,	3 00
Second, J. H. Bell, Emery,	2 00
Gratuities: —	
G. M. Mellen, Corn and Tomatoes,	1 00
S. G. Stone, Minnesota Corn,	1 00
S. Hartwell, Crosby "	1 00

August 10.

Egg Plants. — Four Large Round Purple, John B. Moore,	3 00
Greenflesh Melons. — Four, George Hill,	3 00
Muskmelons. — Four, J. H. Bell,	3 00
Gratuities:	
Samuel G. Stone, Stowell's Evergreen Corn,	1 00
John Cummings, Tomatoes,	1 00
Mrs. E. M. Gill, "	1 00
S. Hartwell, Potatoes and Corn,	1 00
M. W. Chadbourne, Tomatoes and Corn,	1 00
Charles Garfield, " " "	1 00

August 17.

Greenflesh Melons. — Four, Warren Heustis,	3 00
Second, Walter Russell,	2 00
Third, George Hill,	1 00
Muskmelons. — Four, J. H. Bell,	3 00
Second, George Hill,	2 00
Egg Plants. — Four Large Round Purple, J. B. Moore,	3 00
Second, Walter Russell,	2 00
Third, Josiah Crosby,	1 00
Gratuities: —	
George M. Mellen, Tomatoes,	1 00
Mrs. E. M. Gill, "	1 00
Charles Garfield, "	1 00
Josiah Crosby, Greenflesh Melons,	1 00
Samuel Hartwell, Muskmelons,	1 00
" " Burr's Corn,	1 00
C. E. Grant, Lima Beans and Corn,	2 00
C. N. Brackett, Squash Peppers,	1 00
B. K. Bliss, Asparagus,	1 00

August 24.

Beans. — Two quarts Large Lima, B. G. Smith,	3 00
Second, Samuel Hartwell,	2 00
Third, C. E. Grant,	1 00

Peppers. — Twelve, C. N. Brackett,	$3 00
Second, Josiah Crosby,	2 00
Third, James Bard,	1 00
Gratuities: —	
J. B. Moore, collection,	3 00
A. D. Capen, collection of Tomatoes,	1 00
J. Cummings, Corn and Tomatoes,	2 00
C. E. Grant, " " "	1 00
Mrs. E. M. Gill, collection of Beans,	1 00
C. M. Atkinson, Champion of England Peas,	1 00
S. Hartwell, Muskmelons,	1 00
S. G. Stone, Lima Beans,	1 00

August 31.

Watermelons. — Pair, S. Hartwell, Mountain Sprout,	3 00
Second, J. H. Bell, Black Spanish,	2 00
Third, S. Hartwell, Mountain Sweet,	1 00
Greenflesh Melons. — Four, J. B. Moore,	3 00
Second, J. H. Bell,	2 00
Third, Warren Heustis,	1 00
Gratuities: —	
Josiah Crosby, Celery,	2 00
W. C. Child, Lima Beans,	1 00
C. E. Grant, Cocoanut Squashes,	1 00
Mrs. E. M. Gill, collection of Beans,	1 00
John Cummings, collection,	3 00
Samuel Hartwell, "	2 00
J. B. Moore, "	2 00

September 7.

Celery. — Four roots, Josiah Crosby,	3 00
Salsify. — Twelve, Walter Russell,	3 00
Second, John Cummings,	2 00
Cauliflowers. — Four, John Cummings,	3 00
Gratuities: —	
J. B. Moore, Greenflesh Melons,	1 00
G. M. Mellen, Squashes,	1 00
D. R. Beckford, Jr., Tomatoes,	1 00
C. Terry, Potatoes,	1 00
Samuel G. Stone, Lima Beans,	1 00
Samuel Hartwell, "	1 00
Charles Garfield, collection,	1 00
J. Cummings, "	1 00
Mrs. E. M. Gill, "	2 00
A. D. Capen, "	1 00

ANNUAL EXHIBITION.

SEPTEMBER 17, 18, 19, AND 20.

BEETS. — Turnip Rooted, George F. Stone,	$3 00
Second, Walter Russell,	2 00
Third, M. W. Chadbourne,	1 00
CARROTS. — Long Orange, Walter Russell,	3 00
Second, Josiah Crosby,	2 00
Third, John Cummings,	1 00
Intermediate, Walter Russell,	3 00
Second, Josiah Crosby,	2 00
Third, John Cummings,	1 00
CORN. — Sweet, James Comley,	3 00
Second, John Cummings,	2 00
Third, Mrs. E. M. Gill,	1 00
Field Corn, Mrs. M. T. Goddard,	3 00
Second, C. N. Brackett,	2 00
Third, J. B. Tilley,	1 00
CAULIFLOWERS. — Four, John Cummings,	4 00
Second, J. B. Moore,	3 00
CELERY. — Four roots, Josiah Crosby,	4 00
Second, Walter Russell,	3 00
TOMATOES. — Three varieties, J. Cummings,	4 00
Second, J. Cummings,	3 00
Third, Samuel Hartwell,	2 00
Arlington, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Boston Market, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Emery, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Gen. Grant, J. Cummings,	2 00
Second, S. Hartwell,	1 00
Any other variety, J. Cummings, Paragon,	2 00
Second, J. J. H. Gregory, Paragon,	1 00
OKRA. — Twenty-four, Mrs. M. T. Goddard,	2 00
MARTYNIAS. — Twenty-four, G. W. Pierce,	2 00
Second, Anthony Hatch,	1 00
CRANBERRIES. — Half-peck, O. M. Holmes,	3 00
GREENFLESH MELONS. — Four, J. H. Bell,	3 00
Second, Edward Sumner,	2 00
Third, S. Hartwell,	1 00
WATERMELONS. — Pair, I. P. Dickinson, Excelsior,	3 00
Second, " " Gypsy,	2 00
Third, " " Black Spanish,	1 00

Beans. — Large Lima, B. G. Smith,	$3 00
Second, M. H. Merriam,	2 00
Third, S. Hartwell,	1 00
Parsnips. — Long, W. A. Crafts,	3 00
Second, M. W. Chadbourne,	2 00
Third, John L. De Wolf,	1 00
Potatoes. — Four varieties, Mrs. M. T. Goddard,	4 00
Second, John Cummings,	3 00
Early Rose, J. L. De Wolf,	3 00
Second, J. Cummings,	2 00
Third, J. B. Moore,	1 00
Snow Flake, Walter Russell,	3 00
Second, J. L. De Wolf,	2 00
Third, J. Cummings,	1 00
Any other variety, Mrs. M. T. Goddard, King of the Earlies,	3 00
Second, W. Russell, Early Vermont,	2 00
Third, J. Cummings, Eureka,	1 00
Salsify. — Twelve, W. A. Crafts,	3 00
Second, J. L. De Wolf,	2 00
Third, Walter Russell,	1 00
Squashes. — Canada, C. E. Calder,	3 00
Second, Mrs. M. T. Goddard,	2 00
Third, W. A. Crafts,	1 00
Hubbard, George Hill,	4 00
Second, Walter Russell,	3 00
Third, J. Cummings,	2 00
Marblehead, J. J. H. Gregory,	4 00
Second, George Hill,	3 00
Third, John Cummings,	2 00
Marrow, George Hill,	4 00
Second, C. E. Calder,	3 00
Third, J. Cummings,	2 00
Turban, J. Cummings,	4 00
Second, J. J. H. Gregory,	3 00
Third, John Sias,	2 00
Largest and best Mammoth, not less than 100 lbs., the Society's Bronze Medal, to Josiah Newhall; weight of specimen, 160 lbs.	
Turnips. — Twelve, S. Hartwell,	3 00
Second, Mrs. M. T. Goddard,	2 00
Swedish, S. Hartwell,	3 00
Second, Mrs. M. T. Goddard,	2 00
Cabbages. — Drumhead, J. Cummings,	4 00
Second, Walter Russell,	3 00
Third, J. B. Tilley,	2 00
Red, J. Cummings,	4 00
Second, Mrs. M. T. Goddard,	3 00

Savoy, J. Cummings,	$4 00
Second, J. B. Tilley,	3 00
Third, Walter Russell,	2 00
Horseradish. — Six roots, Walter Russell,	3 00
Peppers. — Twenty-four, C. N. Brackett,	3 00
Second, Walter Russell,	2 00
Third, Josiah Crosby,	1 00
Onions. — Danvers Yellow, George Hill,	3 00
Second, Walter Russell,	2 00
Third, J. Cummings,	1 00
Red, Walter Russell,	3 00
Second, S. Hartwell,	2 00
Third, J. J. H. Gregory,	1 00
Portugal, Josiah Crosby,	3 00
Egg Plant. — Large Purple, Walter Russell,	3 00
Second, George W. Pierce,	2 00
Third, J. B. Moore,	1 00

Gratuities : —

M. H. Merriam, Cayenne Peppers,	1 00
James Comley, " "	1 00
Mrs. E. M. Gill, Lima Beans,	1 00
Charles Garfield, " "	1 00
J. Gardiner, Kidney Beans,	1 00
John B. Turner, collection of Beans,	1 00
C. M. Atkinson, Lettuce,	1 00
D. R. Beckford, Jr., Tomatoes,	1 00
G. W. Pierce, collection of Tomatoes,	1 00
J. J. H. Gregory, Butman Squashes,	1 00
Lewis Slack, Canada "	1 00
Walter Russell, Parsley,	1 00
M. W. Chadbourne, collection,	3 00
C. E. Grant, "	1 00
J. H. Bell, "	1 00
Josiah Newhall, "	1 00
Julius R. Wakefield, collection of Gourds,	1 00

October 5.

Cauliflowers. — Four, John B. Moore,	3 00
Second, John Cummings,	2 00
Third, Walter Russell,	1 00
Celery. — Four roots, Walter Russell,	3 00
Second, Josiah Crosby,	2 00
Cabbages. — Drumhead, J. Cummings,	3 00
Second, W. S. Janvrin,	2 00
Red, John Cummings,	3 00
Savoy, " "	3 00
Second, Walter Russell,	2 00

Salsify. — Twelve, Walter Russell,	$3 00
Second, F. B. Hayes,	2 00
Horseradish. — Six roots, Walter Russell,	3 00

Gratuities: —

F. B. Hayes, Mushrooms,	1 00
C. E. Calder, Lettuce,	1 00
C. E. Grant, collection,	1 00
Samuel Hartwell, Tomatoes,	1 00
Benjamin G. Smith, Lima Beans,	1 00
Samuel G. Stone, " "	1 00

October 19.

Gratuities: —

Josiah Crosby, Celery,	1 00
F. B. Hayes, Mushrooms,	1 00

October 26.

Gratuity: —

Samuel G. Stone, Lima Beans,	1 00

November 9.

Gratuities: —

C. E. Grant, collection,	1 00
A. S. McIntosh, Artichokes,	1 00
F. B. Hayes, Mushrooms,	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1878.

By JOSEPH H. WOODFORD, Chairman.

Your Committee have been fortunate this year in receiving invitations to inspect two estates not entered for prizes. The first visit was on the 24th of May, to C. S. Sargent's, at Brookline. This estate consists of over one hundred and thirty acres, situated in the most delightful part of the town. The surface of the ground is undulating, and its natural advantages have been judiciously utilized by the tasteful grouping of trees, shrubs, and plants. American and foreign evergreens, and choice Chinese and Japan shrubs and trees are to be seen in profusion, giving an air of refined taste to the whole estate. Choice azaleas, rhododendrons, and palms, resplendent with bloom and fine foliage, were elegantly arranged under a huge tent, and proved wonderfully attractive, probably more so than usual, to the thousands of people who annually visit this beautiful estate. The Fernery, and arrangement of plants in it, caused many exclamations of pleasure and delight. Groupings of echeverias and agaves were also much admired. In fact, the whole place presented an appearance of great study, and the successful combination of natural advantages with skilled art in the management of trees and shrubs, and laying out of the grounds. Mr. Sargent, in the largeness of his heart, annually throws his grounds open to the public; and multitudes

avail themselves of his generous hospitality, and will forever bless his name for giving them days of restful pleasure amid the beauties he has culled from every clime.

To Mr. Sargent your Committee are much indebted, and beg to thank him most heartily for the noble example he maintains from year to year for others to emulate, and for the joy he dispenses broadcast to the many visitors who annually appreciate such generosity and hospitality.

The second visit was made on the 22d of June, to the "Hermitage," the delightful residence of William Gray, Jr., the President of our Society. The weather was decidedly cold and rainy, yet there was a goodly gathering of the veterans of the Society on this occasion, and a cordial welcome was extended to us as we entered Mr. Gray's hospitable mansion. A good fire of hickory logs was burning on the hearth, and boxes of elegant roses adorned the reception room. After the company had been regaled with a bountiful collation, the rain ceased, and an inspection of the estate began. The naturally undulating surface of the ground had been made more beautiful by careful tilth, and the judicious grouping of trees and shrubs. The whole surface of the estate not covered by trees, or under cultivation, was a close shaven lawn, in excellent condition, and presenting the appearance of a rich green carpet, not only to the eye but to the feet.

Rhododendrons, and other choice foreign and American evergreens, were planted with good taste, and the grouping of tropical and native shrubery and trees was very skilfully done. A spacious tent, which is to remain a permanent fixture, covered a very pretty tropical garden of palms and ferns, grouped in the happiest manner.

The rose garden presented a remarkably vigorous growth of the finest imported plants, some of them showing blooms exceeding five inches in diameter.

On the whole the estate presented a well kept and splendid appearance, and is just such a place as gentlemen of refined taste delight in occupying.

On the 23d day of July your Committee visited the garden of William Doran & Son, at Brookline, which was entered in competition, as a Garden of Small Fruits. This garden consists of two acres of land, which has been brought under cultivation by great

toil and perseverance by the present proprietor, and is entirely devoted to the cultivation of small fruits.

The different kinds of strawberries grown were Downer's Seedling, Lady of the Lake, Kentucky, Wilson, Col. Cheney, and Jucunda, and about 1700 quarts are annually marketed.

The currants were of the following kinds: Versailles, Dutch, Cherry, and Champagne; and the crop was estimated at 2500 quarts. The cultivation was such as to prolong the crop, thereby realizing better prices than could be obtained during the height of the season.

The raspberries consisted of Antwerp, Franconia, and Highland Hardy. The crop was being marketed at the time of our visit, and would amount to about 1200 quarts.

The grapes under cultivation were Concord, and Doran's Seedling, both promising good crops. The usual quantity marketed is about 1000 pounds.

Mr. Doran assured the Committee that the labor of fitting the ground for planting, and of planting and cultivation, had all been performed by himself and family, and that he is now receiving the reward of his labor in a comfortable subsistence from the product of his two acres. It was voted to award him a gratuity of ten dollars, as a slight token of our appreciation of his perseverance and success in small fruit gardening.

On Friday, the 9th of August, your Committee, together with other gentlemen, members of our Society, paid a second visit to the large estate of Francis B. Hayes, at Lexington, which was last year entered for the Hunnewell Triennial Premium. The day proved very boisterous and rainy, deterring a good many of the veterans in horticulture from venturing out; yet, notwithstanding the inclemency of the weather, more than thirty members responded to Mr. Hayes' kind invitation, and were amply repaid for so doing. While we were going over the place, and had ascended to the top of Granny's Hill, which was fully half a mile from any shelter, a most terrific storm of rain and hail burst upon us, completely putting a damper on our spirits for the time being, and making our walk around the farm not very agreeable. When the storm ceased, we resumed our inspection, freely commenting upon the beauties of the place, and discussing the various improvements in contemplation; after which we all again gathered at the mansion, where we were hospitably entertained before leaving to take the train for

Boston. At a subsequent visit to this place by your Chairman, and another member of the Committee, we found other improvements going forward and in contemplation, which will add, when completed, new beauties to this grand estate, and afford greater pleasure to future visitors. Some of these improvements consisted in the removal of rhododendron beds to better locations, with the addition of new and very large plants; new beds of azaleas of the best kinds, and numerous other ornamental trees and shrubs, and the making of a new lawn southeast of the mansion. The present aim of Mr. Hayes seems to be the accumulation of vast quantities of valuable trees and shrubs, with which he will in time make his ample grounds even more beautiful than now, and more attractive to the visitor. The flower plats and borders were in good condition, and the whole estate showed by its keeping that careful attention was being bestowed upon it by a gentleman unsurpassed by any member of our society in his enthusiasm for horticulture. Long may he live to enjoy it!

All of which is respectfully submitted.

J. H. WOODFORD, *Chairman.*

REPORT

OF THE

SPECIAL COMMITTEE ON WINDOW GARDENING.

By Mrs. H. L. T. WOLCOTT, Secretary.

At the meeting of the Society, held on the 2d of March, the following communication was read by the President: —

"The undersigned, interested in advancing a practical taste for horticulture, especially among the children of the laboring classes, desire that the Massachusetts Horticultural Society shall offer prizes for Window Gardening, and conduct all the business of advertising, exhibiting, and awarding prizes.

Rufus Ellis.
Henry W. Foote.
C. A. Bartol."

In response to this request, a special committee, consisting of the Standing Committee on Plants and Flowers, with Mrs. H. L. T. Wolcott, Mrs. E. M. Gill, and Mrs. C. N. S. Horner, was appointed to carry out the object sought. The first meeting of this Committee was held in the Library room, on Thursday, March 7th, at noon.

Ignorance as to the best *methods* to achieve success was the first obstacle in the path of the Committee; therefore the ladies at whose suggestion the request had been made, were asked to attend and more fully explain their plans. After a short discussion it was decided to follow the course the experience of the Society had approved, and to offer prizes and gratuities for plants grown in windows, the Society not to be in any way responsible for any expenditure of money. At an adjourned meeting, a sub-committee, consisting of Messrs. Spooner, Ross, and Hitchings, with Mrs.

Wolcott, was chosen, and to them was committed the work of preparing a list of such plants as could be grown satisfactorily in windows, especially those which would not require a large share of sunlight, and also of arranging a list of prizes to stimulate a healthful rivalry.

The second obstacle confronting the Committee was the difficulty of reaching the children to be encouraged to cultivate the plants. The third was the lesser one of obtaining plants for distribution.

To meet the second obstacle, a circular was issued to the pastor of every church in the city proper, and the outlying wards. In these circulars the co-operation of the pastor, and a lady connected with the Sunday School, was requested. An informal meeting of the Committee, on Tuesday, April 2d, was attended by about forty ladies and gentlemen, who discussed the plans quite fully. At this time generous offers of plants, suitable for the purpose, were made by H. Weld Fuller, and Henry Ross. A Schedule of prizes to be offered was published, uniform with that of the Society's other prizes, and distributed to those schools which had expressed an interest in the subject, as well as to those missionaries who were conversant with the children to be reached. During the month of June but few plants were presented for gratuities. On each Saturday in July and August, plants were offered by the children, and after a few gratuities had been awarded the interest became quite general. On September 14th the Society, through the Committee, opened the Lower Hall for a special exhibition, and a couple of hundred plants were brought for competition according to the Schedule. While the Committee were occupied in deciding on the merits of the specimens, which, to say the least, were not as thrifty as those that usually grace the tables, the criticisms of the passers by were, in a few instances, unfavorable, but a word of explanation as to the raisers was accepted pleasantly, and a Schedule, which contained a brief statement of the work, was carried away to be conned over at home.

Those who have watched this movement from the first, while cognizant of all the difficulties that lie in the way of all new departures, have been encouraged by the interest manifested, and the good results shown. Letters from several gentlemen and ladies bear testimony to the happy influences already noticed. It may here be mentioned, that the day appointed by the Committee for their final show was a fortnight earlier than the day for the

re-opening of some of the schools, and, therefore, two, at least, of our large mission schools were not represented, the pastor and teachers being absent from the city. Of the city schools, that of the church under the pastoral care of Rev. G. J. Prescott was always well represented.

The work of this Committee commenced with the idea of interesting the children of the laboring classes. We feel sure that many children of a larger growth, not belonging to this particular class, will confess to the beneficial influence. The touching spectacle of the procession of little children bearing their plants so proudly through the streets, and presenting them to the Committee, carried its blessing.

In reporting the financial condition of the treasury, with a balance on the right side, we hope to insure for another year that hearty co-operation of all friends of advancement, which will furnish a generous allowance of money.

The amount of cash received by the Committee was		$115 00
Paid for printing circulars, schedules, etc.,	14 00	
" " Advertisement in Boston Herald,	10 00	
" " Gratuities and Prizes,	81 28	
		105 28
Cash on hand,		$9 72

A list of the prizes and gratuities awarded is subjoined.

Respectfully submitted,

HENRIETTA L. T. WOLCOTT,
Secretary of the Committee.

PRIZES AND GRATUITIES AWARDED FOR WINDOW GARDENING.

June 1.

Gratuity : —

Mrs. P. D. Richards, *Gymnogramme sulphurea.*

ROSE SHOW.

June 19.

Gratuity : —

D. R. Beckford, four variegated Pelargoniums.

July 13.

Cut Native Flowers. — First prize, best collection, to D. R. Beckford, Jr. Second prize, to E. W. Mitchell.

July 20.

Gratuities : —

Edward Revaleon, and Sophia Rouse, Cut Flowers, grown in a bay window.

July 27.

Gratuities : —

Edward Revaleon, and Sophia Rouse, Cut Flowers.

August 3.

Gratuities : —

J. Jewett, Coleus; E. W. Mitchell, Torenia; Sophia Rouse, Cut Flowers.

August 17.

Gratuities : —

Maude G. Bartlett, and George A. Mitchell, Fuchsias; W. B. Page, Carnation; Annie E. Middleton, Geranium; Mary L. Mackay, Oxalis.

August 24.

Gratuities : —

William Sweatman, and Lily M. Armstrong, Geraniums; Frank Henkle, Augustus Toop, Helen G. Mackay, W. B. Page, John J. Schwenk, and Dora F. Schwenk, Zonale Geraniums; Richard Middleton, Sweet Scented

Geranium; Minnie Wayne, and Nellie Mackay, Begonias; Robert W. Middleton, Heliotrope; S. Toop, Coleus; Dorcas Dorety, Fuchsias; Martha Page, German Ivy; G. W. Page, and Frank G. Armstrong, Mesembryanthemums; C. E. Page, Oxalis; Augustus Kendal, Carnation; Henry B. Staples, Cut Flowers.

August 31.

Gratuities: —

Nellie Benkett, and William Moore, Geraniums; Lizzie Utz, Joseph Moore, and Ella Remick, Zonale Geraniums: Mary Middleton, Alternanthera; W. H. Middleton, E. Middleton, and E. Mitchell, Begonias; Sarah Tibnam, Kate Middleton, Mary Williams, E. Page, and Anna C. Billings, Fuchsias; W. Middleton, Tradescantia; Robert Tibnam, Coleus; Alice Tibnam, and Julia Billings, Achyranthes; Mary Libby, Mesembryanthemums; Rosetta Middleton, and George Lunt, Ivy.

September 7.

Gratuities: —

Addie Moore, Begonia; Stella B. Staples, Marion H. Hawkins, and Gertrude Hawkins, Pelargoniums; Henry B. Staples, Coleus and Cut Flowers.

September 14.

Sweet Scented Geranium. — Richard Middleton; second, William Moore; third, George E. Armstrong.

Bronze Geranium. — Annie E. Middleton; second, William Sweatman; third, E. W. Mitchell.

Zonale Geranium. — Stella J. Pickett; second, F. Farley; third, Carrie Sandberg.

Hydrangea. — Nellie F. Meeker; second, Zillah Lucas.

Heliotrope. — Hattie Chater; second, William Sweatman; third, W. M. Armstrong.

Begonia. — Alfred Westberg; second, Esther Ottinger; third, A. A. Kennison.

Coleus. — Charles Stearns; second, Sadie Bowman; third, Mrs. Rogers.

Tradescantia. — Jeanette Ottinger; second, E. W. Mitchell.

German Ivy (*Senecio*). — Philip Utz; second, Emma Ottinger; third, A. A. Kennison.

English Ivy. — First, second, and third prizes to Downer Kerosene Oil Co.

Sempervivum. — A. B. Drake.

Bridal Rose (*Rubus rosæfolius*). — Third prize, E. Staples.

Fern. — Single plant, third prize, E. Staples, for *Aspidium acrostichoides.*

Sweet Alyssum. — Second prize, H. Staples.

Gratuities: —

Joseph Moore, Etta A. Stevens, Mary Libby, H. R. Staples, W. B. Page, Anna Schlicht, George Dwyer, and H. Staples, Zonale Geraniums.

John Schwenk, Clara E. Barron, Dora Schwenk, Sarah Dunphy, Esther Ottinger, Mamie Schlicht, —— Groesinger, Frank Dyer, Mrs. H. L. Macker, Flora Burbank, Austin A. Stevenson, Maggie Reed, John H. Mace, Emma Bense, Ella Remick, M. Dame, Frank Marsden, Emma Smith, Frank Henkle, Augustus Toop, and —— Graves, Geraniums; E. A. Mudge, and Willie J. Mudge, Heliotropes.

William Sweatman, Ruth Morriss, Emma F. Smith, Kate Middleton, S. Toop, and E. Smith, Begonias.

A. Wagner and R. Middleton, Foliage Begonias.

William Sweatman, Kate Middleton, Ellen Nugent, and E. Page, Fuchsias.

Mary S. Macker and C. E. Page, Oxalis.

Sadie Bowman, B. Dunphy, Etta F. Stearns, George Middleton, Mary Macker, C. Beeker, S. Toop, H. L. Macker, and Ella L. Stevens, Coleus.

A. E. Shepard, W. Page, Nellie L. Macker, Alice F. Duke, and Maggie Follis, German Ivies.

Addie Morriss, Emma Ottinger, S. E. T. (B. Y. M. C. A.), Frank Henkle, and George L. Libby, English Ivies.

Carrie Gubert, G. W. Page, Mrs. Rogers, Julia Ottinger, Bennie Sandberg, Frank Armstrong, and E. W. Mitchell, Mesombryanthemums.

Moses Sandberg, —— Groesinger, and Mrs. Albert Brown, Centaureas.

Theresa Morriss and F. Macker, Bouvardias.

Ella E. Barron and S. Toop, Salvias.

A. A. Kennison and Sarah Tibnam, Jerusalem Cherries (*Solanum Pseudo-Capsicum*).

John Dunlap, Sempervivum; Ella L. Stevenson, Stock; Rosetta Middleton, Box plants; H. Staples, Wild Flowers, and collection of pot plants; Nellie Macker, Oleander; Mrs. E. L. Muzzey, *Melothria pendula;* R. Petremant, Amaryllis; Jeanette Ottinger, Periwinkle; E. W. Mitchell, *Peristrophe.*

REPORT

OF THE

Committee of Arrangements,

FOR THE YEAR 1878.

The Committee of Arrangements of the Massachusetts Horticultural Society would respectfully submit the following report: —

The weekly exhibitions during the past year have been of great interest, and, in point of excellence, equal to any the Society has ever held in the past. They were fully attended, not only by members, but by large numbers of the public generally.

The Annual Rose Show, and the Exhibition of Strawberries, Cherries, and Early Vegetables, in June, were quite equal, if not superior, to any heretofore held. These also were crowded with visitors who expressed much satisfaction with the exquisite display of rare flowers, and the choice specimens of early fruits and vegetables. These exhibitions, like the weekly ones, were free.

The Annual Exhibition of the Society, in September, was everything that could be wished. Both the quantity and quality of the vegetables, fruits, plants, and flowers, were as fine as of any ever exhibited, and afforded much pleasure and satisfaction, not only to members of the Society, but to many of the public. The arrangement of the halls was in charge of sub-committees appointed from the Committees on Fruits, Flowers, and Vegetables, who performed their duties most acceptably; in fact, nothing was left undone that it was thought would make the exhibition successful; it was well advertised, and very fully noticed by the newspapers, and nothing was omitted whereby we could obtain a large attendance.

When we hear and read of the enthusiasm and financial success attending the exhibitions of the horticultural societies of other cities, we can but feel gratified, knowing as we do that the germs of most of them grew out of our own society, and that they were

formed in consequence of the stimulus given them by our exhibitions. For fifty years the Massachusetts Horticultural Society has been laboring successfully to create a love and taste for the cultivation of choice fruits, vegetables, and flowers, and, thus far, constant progress has been made in their cultivation, and our annual exhibitions have increased in interest from year to year. Not only has this interest been felt by our own members, but the public have also shared in it, as thousands of beautiful gardens throughout the country testify by the great improvement of their fruits and vegetables, and by the display of a vast number of new and choice flowers. The taste for and love of flowers, and the cultivation of choice fruits and fine vegetables, has, by the example of our Society, been extended all over the country. We have every reason to be proud of the work that has been accomplished by the Society—a work commenced and prosecuted with great vigor by our first members, many, indeed most, of whom have passed away, but the remembrance of whose unwearied perseverance is ever present to encourage and strengthen us to prosecute with zealous interest the object for which the Society was founded.

The exhibitions of the past year have fully sustained the reputation of the Society, and we have every reason to believe, if nature smiles favorably on our exertions, that this year, in which occurs our fiftieth anniversary, will be of increased interest to all who have the welfare of the Society at heart.

The record of the various meetings of the Committee would fail to be of especial interest to the members of the Society, confined as they have been to discussions relative to the best means of arranging the halls and the various contributions, perfecting the details concerning the exhibitions, and endeavoring to make them prove interesting to the members and the public at large.

CHAS. H. B. BRECK, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION.

The work of the year appears so fully in the published Transactions, as to make unnecessary any extended report. For the accurate and excellent digest of the discussions, as well as the supervision of all our printed reports, the society is largely indebted to our Secretary.

We are happy to report that the manuscript of the fifty years' history of the Society is now completed, and has been placed in the hands of the Committee for publication. Your Committee have now under consideration the manner and the time of publication. Although no definite plan has been decided upon, yet it may be proper to say that the volume, which will make about four hundred octavo pages, will doubtless be issued during the coming year.

The number of essays competing for prizes has been unusually small this year; hence, we shall have but little material in this form to present at our meetings for discussion. It is, therefore, the more desirable that our members, who have had so much experience in the various branches of our art, should show a readiness to contribute their observations for these discussions. Could we but bring to light the experiments and the results of our most successful cultivators, we should make additions to horticultural knowledge which would be well worthy of permanent record.

A prize of $25 has been awarded to J. W. Pierce, of West Millbury, Mass., for an Essay upon the Culture and Marketing of Apples, with special reference to the increased difficulty in the profitable production of that fruit.

Respectfully submitted by

W. C. Strong,
A. B. Muzzey,
E. L. Sturtevant,
Committee on Publication and Discussion.

Report of the Secretary,

FOR THE YEAR 1878.

The work in this department is so similar in its character from year to year, that a report of it for the past year must necessarily be similar to those of previous years. The usual notes have been made of the discussions, after which they have been written out and submitted to the various speakers for revision. The reports, and other matters contained in the TRANSACTIONS, have been carefully prepared for the press, and superintended while passing through it; and I have endeavored in every way to co-operate with the Committee on Publication and Discussion in collecting and disseminating such information as would be for the advancement of horticulture. The reports of the weekly and annual exhibitions have been prepared for publication in the "Boston Evening Transcript" as heretofore. To the keeping of the former records of the Society and of the Executive Committee, there has this year been added, by vote of the Society, a record of all the awards made by the Fruit, Flower, and Vegetable Committees. Special attention has been given to systematizing the distribution of the publications of the Society, and keeping an exact record of every copy sent out, both to correspondents and immediate members, which, it is believed, will result in a more economical performance of this work. The revision of the lists of Honorary and Corresponding Members has been continued, but after the most diligent inquiry, and very extensive correspondence in every quarter where it seemed probable that information could be obtained, there are yet more than twenty Honorary and Corresponding Members of whom only the names are known. Probably much the larger part of these are now deceased, but until this is certainly known it seems hardly proper to place the star against their names. I would here repeat the request made last year to any persons who may receive our publications, to communicate information for the correction of these lists, or of the lists of the immediate members of the Society.

Quite as many specimens of fruit have been presented for name as usual, and, in the absence of the Fruit Committee, most of these have been placed in my hands. Owing to the great crop of apples, and the small crop of pears, the proportion of apples has been unusually large, and, as the number of varieties of apples grown is much larger than that of pears, and they have been less studied here than pears, the queries propounded for solution have been unusually difficult, but every exertion has been made to answer them.

The History of the Society, which was last year announced as completed to the close of the year 1874, has been continued as far as possible, until the reports for the present year of the various officers and committees are received.

The miscellaneous calls for information have not been less in number than usual, but as it is impossible to particularize them I can only say that they have in every case been answered to the best of my ability, and have, in the aggregate, occupied no inconsiderable portion of time.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

LIBRARY COMMITTEE,

FOR THE YEAR 1878.

Your Committee beg to submit the following report on the condition and progress of the library during the past year:

The Society's appropriation has been expended wholly for periodicals and binding, and the income of the Stickney Fund has been used, according to the terms of the loan, in the purchase of books exclusively. A list of the books and magazines purchased and presented accompanies this report.

Although a larger sum could have been used to advantage for the purchase of periodicals, as the income of the Stickney Fund is limited to the purchase of standard works, the amount of the Society's appropriation has been found sufficient, and it is hoped that a similar appropriation will be made for the ensuing year. We would, however, add that there are a number of valuable periodicals which it would be well for the Society to have, and we trust that with returning prosperity the annual appropriations for the library will be increased.

All of the most useful works on botany and horticulture, published during the year, have been added to the library, and our sets of bound periodicals have, as far as possible, been completed by the purchase of missing volumes. Of late years considerable attention has been turned to the importance of preserving and extending American forests, already almost exterminated in many parts of the country, and to the care and study of forest trees. It is doubtful if any branch of rural improvement now occupies more generally the public mind than the science of forestry, or offers in all its branches a better field for careful study and investigation. Your Committee have endeavored to procure as many works as

possible, in all languages, bearing on this subject, and our library already possesses the most important collection of such works in this country. There are many books of this class too rare and valuable for private libraries, and your Committee have procured such works when possible, placing them within the reach of many who could not obtain them in any other way.

It is very desirable that the Society's regulation providing that a bulletin shall be posted in the Library Room, giving the titles of the new books as they are added, should be complied with, and it is hoped that within a few years, the Society will be able to publish a new Catalogue, or a supplement to the present one.

The want of additional shelf room is more seriously felt each year, and it will soon become an absolute necessity for the Society to consider the extension of the library accommodations.

In this connection, it will be well to consider the necessity of carefully preserving, in such a manner as to render them at all times accessible to the members of the Society, the numerous valuable pamphlets, and other occasional publications on rural matters which could be easily procured by gift or purchase, and which, if properly cared for, would form one of the most valuable departments of the library. Such publications your Committee have not endeavored to procure, as no provision for their care has ever been made, it having been the custom of those directly in charge of the library to dispose of such pamphlets and journals as seemed of little value to them, to other societies, on the plea of want of accommodation. It is very desirable that every journal relating to horticulture or agriculture, and every pamphlet and catalogue sent to the Society, should be carefully preserved and bound, and thus made accessible for future examination and study.

Your Committee also consider it their duty to direct the attention of the Society to the uses for which their Library Rooms are employed; uses which render them unfit places for quiet reading or study. While the propriety of leasing the Society's halls is not disputed, it is submitted that the rooms containing one of the most valuable horticultural and botanical libraries in the world, should not be turned into a general headquarters for the managers of the miscellaneous exhibitions which visit Boston, and who, by their loud conversation and passing to and fro, cause a confusion which is not in harmony with the objects of the Society, and which especially interferes with the legitimate uses of the library.

The fern case presented by Mr. Davenport had become much overcrowded by the numerous specimens added by that gentleman, and a new one has been made under his kind supervision, giving ample accommodation for future additions, besides much improving the appearance of the room. It may be of interest to add that those most capable of judging, consider this to be one of the most valuable and complete collections of North American ferns in existence, and the Society is very fortunate in possessing such a treasure.

As all the library bills will not have been paid until the close of this year, the exact amounts expended by your Committee will appear in the Report of the Treasurer.

For the Committee,

WALDO O. ROSS, *Chairman.*

LIBRARY ACCESSIONS.

Books Purchased.

Decandolle, A. et C. Monographiæ Phanerogamarum, etc. Vol. 1., Smilaceæ, Restiaceæ, Meliaceæ. 9 plates. Large 8vo. Paris: 1878.

Watson, Sereno. Bibliographical Index to North American Botany. Part. 1, Polypetalæ. 8vo. Washington: 1878.

Elwes, Henry John, F. L. S., F. Z. S. A Monograph of the Genus Lilium. Illustrated by W. H. Fitch, F. L. S. Parts 1–4. Folio. 32 colored plates. London: 1877.

Chaté, E. Fils. Le Canna. 16mo. Paris: no date.

Bradley, Richard, F. R. S. History of Succulent Plants. Small 4to. 50 plates. London: 1716.

Bentley, Robert, F. L. S., and Henry Trimen, M. B., F. L. S. Medicinal Plants. Parts 19–36, in continuation. 8vo. colored plates. London: 1877, 78.

Gray, Asa, LL. D. Synoptical Flora of North America. Gamopetalæ after Compositæ. Vol. 2. Part I. Large 8vo. New York: 1878.

Flora Danica. Fasciculus XLIX. Folio. Plates 2881–2940. Copenhagen: 1877.

Oliver, Daniel, F. R. S., F. L. S. Flora of Tropical Africa. Vol. 3. Umbelliferæ to Ebenaceæ. 8vo. London: 1877.

Baker, J. G., F. L. S. Flora of Mauritius and the Seychelles. 8vo. London: 1877.

Bentham, G. Flora Australiensis. Vols. 5, 6, and 7. Myoporineæ to Filices. 8vo. London: 1870–78.

Crépin, François. Guide du Botaniste en Belgique. 12mo. Paris: 1878.

Lavallée, Alph. Arboretum Segrezianum. Énumération des Arbres et Arbrisseaux, cultivés a Segrez. 8vo. Paris: 1877.

Gordon, George, A. L. S. The Pinetum. 2d Edition. 8vo. London: 1875.

Brown, James, LL. D. The Forester; or a Practical Treatise on the Planting, Rearing, and General Management of Forest Trees. 4th edition. Thick 8vo. 137 wood-cuts. London and Edinburgh: 1871.

Laslett, Thomas. Timber and Timber Trees, Native and Foreign. Small 8vo. 34 wood-cuts. London: 1875.

Edinburgh Botanical Society's Transactions. Vols. 1–12. 8vo. Many plates. Edinburgh: 1844–1876.

Highland and Agricultural Society's Transactions. 4th series. Vols. 1–9. 8vo. Edinburgh, 1866–77. [Continuation of the Prize Essays of the Highland Society.]

Country Gentleman. Vols. 1–14. 4to. Albany, 1853–59.

American Agriculturist. Vols. 1–8, 10. 9 vols. 8vo. 12–14, 16, 17. 5 vols. 4to. New York, 1842–58.

Gardener's Chronicle and Agricultural Gazette. 1855, '56, '57, '59. 4 vols. Folio. London.

Williamson, John. Ferns of Kentucky. Small 8vo. 66 plates, with wood-cuts. Louisville: 1878.

Smith, John, A. L. S. Historia Filicum. Small 8vo. 30 lithographic plates. London: 1875.

Robinson, John. Ferns in Their Homes and Ours. Small 8vo. 22 plates. Salem, 1878.

Waring, George E., Jr. Village Improvements and Farm Villages. 16mo. 16 wood-cuts. Boston: 1878.

Egleston, Nathaniel Hillyer. Villages and Village Life, with Hints for their Improvement. Small 8vo. New York: 1878.

Miller, Philip, F. R. S. Figures of the most Beautiful, Useful, and Uncommon Plants, described in the Gardener's Dictionary, with Descriptions, etc. 2 vols. Folio. 300 colored plates. London: 1771.

Robinson, William, F. L. S. The Parks and Gardens of Paris. 2d ed. 8vo. Many wood-cuts. London: 1878.

Pulteney, Richard, M. D., F. R. S. A General View of the Writings of Linnæus, with Memoir, etc. 2d edition. 4to. Portraits and other plates. London: 1805.

Prior, R. C. A., M. D. Popular Names of British Plants. Small 8vo. London: 1870.

Tillinghast, Isaac F. A Manual of Vegetable Plants. Thin 12mo. Factoryville, Pa.: 1878.

Wallace, Alfred R. Tropical Nature, and other Essays. Large 8vo. London: 1878.

Tanner, Henry, F. C. S. First Principles of Agriculture. 16mo. London: 1878.

Nichols, James R., M. D. Chemistry of the Farm and Sea, etc. 12mo. New York. No date. [1875?]

Thomas, John J. Annual Register of Rural Affairs. Vol. 8. 1876, 7, 8. Small 8vo. 441 wood-cuts. Albany: 1878.

United States Centennial Commission. International Exhibition, 1876. Reports and Awards. Groups VI., XXIII., XXIX., XXXVI. 8vo. Philadelphia: 1877, 78.

Books and Pamphlets Presented.

Meehan, Thomas. The Native Flowers and Ferns of the United States. Vol. 1. Imp. 8vo. 48 colored plates. Boston: 1878. L. Prang & Co.

Vilmorin, Andrieux et Cie. Les Fleurs de Pleine Terre, etc. 3d edition. Large 12mo., nearly 1300 wood-cuts. Paris: 1870. Vilmorin, Andrieux et Cie.

Vilmorin's Atlas of Flowers. English edition of Atlas de Fleurs de Pleine Terre. Small 8vo. 1128 wood-cuts. Vilmorin, Andrieux et Cie.

——— Illustrirte Blumengartnerei. 8vo. 1235 wood-cuts. Berlin: 1873. Vilmorin, Andrieux et Cie.

Victoria Regia. Four water color paintings, with manuscript description, etc. Francis Parkman.

Hough, Franklin B. Report on Forestry; prepared under the direction of the Commissioner of Agriculture. 8vo. Washington: 1878. W. G. LeDuc, Commissioner.

Sargent, C. S. Notes on Trees and Tree Planting. 8vo. pamphlet. Boston: 1878. The Author.

Barney, E. E. Facts and Information in relation to the Catalpa Tree. 8vo. pamphlet. Dayton, Ohio: 1878.

Robinson, John. The Pine, its Life and Importance in Essex County. [From the Bulletin of the Essex Institute, July–September, 1878.] 8vo. pamphlet. The Author.

——— ———. Ferns in their Homes and Ours. Small 8vo., 22 plates. Salem: 1878. The Author.

Davenport, George E. Aspidium Spinulosum (Swartz) and its Varieties 8vo. pamphlet. [From the American Naturalist, November, 1878.] The Author.

——— ——— —. Notes on Botrychium Simplex. 4to. pamphlet. 1877. John Robinson.

List of the Native and Exotic Ferns in the Greenhouses and Grounds of J. Warren Merrill, at Cambridge, Mass. 8vo. pamphlet. Boston: 1878. J. W. Merrill.

Plans of Flower Gardens, Beds, Borders, Roseries, and Aquariums. By Contributors to the Journal of Horticulture. 8vo. 72 wood-cuts. London: no date. W. O. Ross.

Pearson, J. R. Vine Culture under Glass. 16mo., wood-cuts. London: 1867. W. O. Ross.

Atwater, Prof. W. O. Potash in Agriculture. 8vo. pamphlet. The Author.

Thomas, Flavel S., A. M., M. D., etc. Lectures on the Science of Agriculture. 8vo. pamphlet. Salem: 1876. 3 copies. Naturalist's Agency.

Sturtevant, Dr. E. Lewis. Intercultural Tillage. 8vo. pamphlet. The Author.

Ernst, A. Estudios Sobre las Deformaciones, Enfermedades, y Enemigos del Arbol de Cafe en Venezuela. 4to. pamphlet. Caracas: 1878. George E. Davenport.

Dearborn, Gen. H. A. S.; Twenty-nine Manuscript Letters to. 1816–1850. J. Coburn.

Ohio Horticultural Society; Eleventh Annual Report, 1877–78. 8vo. pamphlet. Columbus: 1878. M. B. Batcham, Secretary.

Wisconsin Horticultural Society; Transactions at Meetings, June, 1877, and February, 1878. 8vo. Madison: 1878. F. W. Case, Secretary.

New Jersey Horticultural Society; Proceedings at the Third Annual Meeting; New Brunswick, February, 1878. 8vo. pamphlet. E. Williams, Secretary.

Worcester County Horticultural Society; Transactions for 1877. 8vo. pamphlet. Worcester: 1878. E. W. Lincoln, Secretary.

Western New York Horticultural Society; Proceedings at the Twenty-third Annual Meeting, Rochester, January, 1878. 8vo. pamphlet. Rochester: 1878. P. C. Reynolds, Secretary.

Bulletin de la Société Centrale d'Horticulture du Départment de la Seine-Inferieure. Vol. 19, and Parts 1–3, of Vol. 20. 8vo. Rouen: 1877, 78. The Society.

Michigan Pomological Society; Seventh Annual Report of the Secretary, for 1877. 8vo. Lansing: 1878. C. W. Garfield, Secretary.

Pennsylvania Fruit Growers' Society; Report for 1877. 8vo. pamphlet. 5 plates. Harrisburg: 1878. 2 copies. E. B. Engle, Secretary.

Ontario Fruit Growers' Association; Report for 1877, and Report of the Entomological Society for 1877. 8vo. pamphlet. Toronto: 1878. D. W. Beadle, Secretary.

Bussey Institution Bulletin. Vol. 2, Part 3. 8vo. pamphlet. Boston: 1878. C. S. Sargent.

New York Department of Public Parks; Third Annual Report of the Board of Commissioners. May 1, 1872, to December 31, 1873. F. Becker, Jr.

Fairmount Park Commissioners' Annual Report for 1877. 8vo. Plates. Philadelphia: 1878. The Commissioners.

Chicago South Park Commissioners' Report to the Board of County Commissioners of Cook County, Illinois, from December 1st, 1876, to December 1st, 1877. 8vo. pamphlet. Photographs. Chicago: 1878. 2 copies. H. W. Harmon, Secretary.

Massachusetts Society for Promoting Agriculture; Transactions, New Series, Vol. I. 8vo. Boston: 1858.

Rhode Island Society for the Encouragement of Domestic Industry; Transactions, 1858–71. 14 pamphlets. 8vo. Providence: 1859–1872. J. S. Pitman, Secretary.

Essex Agricultural Society; Transactions for 1877. 8vo. pamphlet. Salem: 1877. 2 copies. B. P. Ware, President.

Bristol County Agricultural Society; Report for 1877. 8vo. pamphlet. Taunton: 1878. D. L. Mitchell, Secretary.

Hingham Agricultural and Horticultural Society; Transactions for 1877. 8vo. pamphlet. 1878.

Iowa State Agricultural Society; Reports of the Secretary for 1876 and 1877. 2 vols. 8vo. Des Moines: 1878. J. R. Shaffer, Secretary.

New Hampshire Board of Agriculture; Reports, Vols. 4, 5, and 6. 3 vols. 8vo. Concord: 1874–76. Centennial Papers. One Hundred Years' Progress, and Reports and Addresses relative to the Centennial Exhibition, 1876. 8vo. pamphlet. Wood-cuts. Concord: 1877. James O. Adams, Secretary.

Vermont Board of Agriculture; Fourth Report for the year 1877, and Eighth Annual Report of the Secretary of the Vermont Dairymen's Association. 8vo. Montpelier: 1877. Henry M. Seeley, Secretary.

Massachusetts Board of Agriculture; Twenty-fifth Annual Report of the Secretary, for 1877–78, with Index to the volumes from 1853 to 1877. Boston: 1878. C. L. Flint, Secretary.

Connecticut Board of Agriculture; Eleventh Report of the Secretary, 1877–78. 8vo. Hartford: 1878. T. S. Gold, Secretary.

Connecticut Agricultural Experiment Station; First Annual Report, 1876. 8vo. pamphlet. Hartford: 1877. Prof. W. O. Atwater.

Pennsylvania Board of Agriculture; First Annual Report, for the year 1877. 8vo. plates. Harrisburg: 1878. Thomas J. Edge, Secretary.

North Carolina Commissioner of Agriculture; Fourth Quarterly Report, April 16, 1878. 8vo. pamphlet. Raleigh: 1878. L. L. Polk, Commissioner.

Report on the General Condition of the Agricultural Interests of North Carolina. From returns made to the Department of Agriculture, March, 1878. 8vo. pamphlet. L. L. Polk, Commissioner.

Sugar Beet, Experiments with, in North Carolina. Report by Albert R. Ledoux, Ph. D., Chemist to the Department of Agriculture, etc. 8vo. pamphlet. Raleigh: 1878. L. L. Polk, Commissioner.

Analysis and Valuation of Fertilizers for 1877 and 1878; reported by Dr. Albert R. Ledoux. 8vo. pamphlet. Raleigh: 1878. L. L. Polk, Commissioner.

Georgia Commissioner of Agriculture; Fourth and Fifth Annual Reports for 1877. 2 pamphlets. 8vo. Atlanta: 1878. Thomas P. Janes, Commissioner.

Result of the Soil Test of Fertilizers for the year 1877; conducted under the direction of the Commissioner of Agriculture of the State of Georgia: also, Analyses of Fertilizers sold in Georgia. 8vo. pamphlet. Atlanta: 1878. T. P. Janes, Commissioner.

The Farmer's Scientific Manual; prepared under the direction of Thomas P. Janes, Commissioner of Agriculture of the State of Georgia. 8vo. 29 wood-cuts. Atlanta: 1878. The Commissioner.

Janes, T. P. A Manual of Georgia, for use of Capitalists and Immigrants. 8vo. pamphlet. Atlanta: 1878. The Author.

Michigan Board of Agriculture; Sixteenth Annual Report of the Secretary, for 1877. 8vo. Lansing: 1878. R. G. Baird, Secretary.

Indiana Board of Agriculture; Twenty-Seventh Annual Report, for 1877. 8vo. Indianapolis: 1878. Alex. Heron, Secretary.

Illinois Department of Agriculture; Transactions for 1876. Vol. 6, New Series. 8vo. Springfield: 1878. S. D. Fisher, Secretary.

Missouri Board of Agriculture; 1st, 2d, 3d, 4th, 5th, 6th, 8th, 10th, and 11th Annual Reports, for 1865, '66, '67, '68, '69, '70, '72, '74, and '75. 9 vols. 8vo. Jefferson City: 1867–1876. Also, 1st, 2d, and 10th Reports in German, for 1872, '73, and '74. 3 thick pamphlets. 8vo. Jefferson City: 1872–75. Isidor Bush.

Kansas Board of Agriculture; Fifth Annual Report, 1876. 8vo. Maps and diagrams. Topeka: 1877. Alfred Gray, Secretary.

Massachusetts Agricultural College; Fifteenth Annual Report. 8vo. pamphlet. Boston: 1878. C. L. Flint, Secretary State Board of Agriculture.

Michigan Agricultural College; Twenty-First Annual Catalogue, for 1877. 8vo. pamphlet. Lansing: 1877.

American Veterinary College, No. 141 West Fifty-Fourth Street, New York; Fourth Annual Announcement, Session 1878–79. 8vo. pamphlet. New York: 1878.

Cornell University Register and Catalogue, 1877–78. Small 8vo. pamphlet. Ithaca: 1878. W. R. Lazenby.

Louisiana State University and Agricultural and Mechanical College; Report of the Board of Supervisors, Session 1877–78. 8vo. pamphlet. New Orleans: 1878. D. F. Boyd, President of the Faculty.

Woodruff Scientific Expedition Around the World; Programme. 8vo. pamphlet.

Boston Society of Natural History; Memoirs. Vol. 2, Part 4, No. 6. 4to. pamphlet. Proceedings. Vol. 19. Part 2. 8vo. pamphlet. The Society.

Massachusetts Board of Health; Eighth Annual Report for 1876. 8vo. Boston: 1877.

American Antiquarian Society; Proceedings, Nos. 70 and 71. 2 pamphlets. 8vo. Worcester: 1878. The Society.

Missouri Board of Immigration; First Report, for 1865 and 1866. With the First Report of the Commissioners of Statistics for 1866. 8vo. Jefferson City: 1867. Also, duplicate of the latter. Thick, 8vo. pamphlet. Jefferson City: 1866. Isidor Bush.

Missouri Geological Survey, 1855–71, 1872, 1873–74. 3 vols. 8vo. Maps and plates. Jefferson City: 1873–4. Also, two large Atlases accompanying. Isidor Bush.

Periodicals Taken.

English. — Gardeners' Chronicle.
Gardener's Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Curtis' Botanical Magazine.
Floral Magazine.
Florist and Pomologist.
Floral World.
Journal of the Linnean Society.

Journal of Botany.
Country Gentleman's Magazine.
Journal of the Royal Agricultural Society.
Journal of Forestry.
Field and Forest.
FRENCH. — Revue Horticole.
Revue des Eaux et Forêts.
BELGIAN. — Illustration Horticole.
Flore des Serres.
Belgique Horticole.
GERMAN. — Botanische Zeitung.
AMERICAN. — Country Gentleman.
American Farmer.

PERIODICALS PRESENTED.

New England Farmer.
Massachusetts Ploughman.
American Cultivator.
Scientific Farmer.
American Agriculturist.
Gardener's Monthly.
Vick's Illustrated Monthly Magazine.
Bulletino della R. Società Toscana di Orticultura.
Southern California Horticulturist.
American Garden.
American Rural Home.
Maine Farmer.
Prairie Farmer.
Maryland Farmer.
Semi-Tropical.
Western Agriculturist.
Bulletin of the Essex Institute.
Bulletin of the Torrey Botanical Club.
Botanical Gazette.
New York Weekly Tribune.
New York Semi-Weekly Times.
Rhode Island Press.
Boston Evening Transcript.
Boston Daily Globe.
Daily Evening Traveller.
Boston Morning Journal.
Boston Daily Advertiser.
The Nursery.
The Cottage Hearth.
Familiar Science and Fancier's Journal.

TREASURER'S REPORT,

FOR THE YEAR 1878.

ITEMS OF INCOME.

Balance of Cash on hand,	$425 93
Received for Rent of Stores,	8,185 59
" " " " Halls,	6,765 68
" " Admissions and Assessments,	658 00
" from William Gray, Jr., to pay Prizes,	80 00
" Interest on Bonds, C. B. & Q. R. R.,	105 00
Gross Receipts of Annual Exhibition,	229 50
Received from estate of B. V. French,	2,511 13
" " Mount Auburn Cemetery,	1,679 68
	$20,640 51

ITEMS OF EXPENDITURE.

Salaries,	$3,525 00
Library accessions (Stickney fund),	700 22
" " Periodicals and Binding,	218 42
Heating and Water (less paid by tenants),	281 22
Printing,	839 42
Stationery and Postage,	158 31
Gas,	945 07
Repairs on Building,	125 29
Furniture, and Repairs,	74 82
Fixtures, " "	80 46
Taxes,	2,909 51
Interest,	3,691 42
Testimonial to Ex-President Parkman,	100 00
Portrait of President Gray,	200 00
Expenses of Annual Exhibition,	197 18
Amount carried forward,	$14,046 34

Amounts brought forward,	$14,046 34	$20,640 51
Entertainment of Committee of Arrangements,	226 30	
Expended by the Committee on Publication and Discussion,	95 00	
Legal Services,	105 00	
Labor and Incidentals,	597 37	
Balance of Prizes for 1877,	1,251 89	
Deposited to pay Prizes of 1878,	4,000 00	
Balance carried to new account,	318 61	
		$20,640 51

Boston, January 15, 1879.

E. W. Buswell, *Treasurer:*

Sir, — We have examined the books and accounts of the Society as rendered by you, and find them correct and entirely satisfactory.

C. O. Whitmore,
H. H. Hunnewell,
B. P. Cheney,
} *Finance Committee.*

ASSETS AND LIABILITIES.

Assets.

Real Estate, Furniture, and Exhibition Ware, costing		$256,585 56
Library, last year,	$17,148 81	
Added this year,	918 64	
		18,067 45
Bonds of C. B. & Q. R. R., par value,		1,500 00
Total,		$276,153 01

Liabilities.

Mortgage debt at 5½ per cent., payable September, 1883,	$60,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	
Note to Market National Bank,	12,000 00	
		$84,000 00
Balance of assets over liabilities,		$192,153 01

By last report our members numbered . . .				953
Viz: Life members, . .		581		
Added by election, .	3			
" " commutation,	1			
	—	4		
		585		
Deceased, . .		8		
			577	
Annual members, . .		372		
Added, ...		9		
		381		
Commuted, ...	1			
Deceased, ...	6			
Withdrawn, . . .	1			
Discontinued for non-payment of dues, ...	50			
	—	58		
			323	
				900

Income from the above:	
3 Life, ...	$90 00
1 Commutation, . . .	20 00
9 Annual, ...	90 00
229 Assessments, . . .	458 00
	$658 00

The depression in business which has so long and universally pervaded the community, has taken us in its course, and admonished us to observe the strictest economy in all our expenditures. The warning has not passed unheeded. Our few sources of income have been watched and nursed with due care and consideration, letting pass no opportunity to add in any measure to our resources. The stores have been kept up to the full standard of rent, consistent with occupancy, and are now all tenanted except one; that, I hope, soon will be. The halls have been in fair demand at reduced rates; Mount Auburn Cemetery has yielded little more than last year, and membership account less.

With these probabilities in view, your Committees recommended

smaller appropriations, salaries were reduced, and the strictest economy has been practised in carrying on our work. Nevertheless, but for the amount received from the French estate, we must have added to our indebtedness. In view of this condition, salaries and appropriations have been still further reduced, in the hope of being able to make expenditures on the building which cannot well be longer delayed. The whole interior needs rejuvenation, and the wood, iron, and brick work of the roof and exterior need painting to prevent actual loss. The necessity of more space for the library demands early attention, as a subject which must necessarily involve expense at no distant day. A well prepared history of the Society, from its beginning, awaits publication. Such interest is manifested in the work as to warrant the belief that a small edition may be printed and sold, without material detriment to our finances.

In this connection, I am reminded of the Semi-Centennial year of our existence. I wish we were in such circumstances as would enable us to celebrate the event in a manner commensurate with its great importance, and in the spirit of the age; but when material and absolute interests are jeopardized, it behooves us to act with care, and leave the expense to be met by the public spirit of individual members.

The decrease of our membership calls for careful consideration. If, as intimated in my last report, the cause is to be found in the facility with which non-members may avail themselves of the benefit accruing to members, the remedy is plainly before you. I would suggest an alteration in our By-Laws which shall make prizes available to members only, as of old time. Our library, rich in horticultural lore, is, and always has been, free for consultation here, while members may withdraw books under the rules. To me this seems fair and generous to the public.

Respectfully submitted,

E. W. BUSWELL, *Treasurer.*

January 18, 1879.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending Dec. 31, 1878.

Cost of filling up and improving land at Mt. Auburn, for the year ending December 31, 1878, the Massachusetts Horticultural Society being charged with their proportion of the same:			By Sales in January,	$850 00
Grading Stone Farm,	$431 44		" " " February,	172 07
" Vernonin Path,	45 94		" " " March,	1,487 58
" Fountain Avenue,	1,162 56		" " " April,	2,110 00
			" " " May,	614 00
One quarter of	$1,639 94	$409 98	" " " June,	472 00
Balance due Massachusetts Horticultural Society,		$1,679 68	" " " July,	478 00
			" " " August,	265 00
			" " " September,	189 00
			" " " October,	620 00
			" " " November,	285 00
			" " " December,	1,810 00
			" Net amount of receipts from Receiving Tomb,	430 00
				$9,782 65
			Less paid for Grave in Public Lot, repurchased,	24 00
				$9,758 65
			Deduct for Annual Expenses,	1,400 00
			Mass. Horticultural Society, one-fourth part of	$8,358 65
		$2,089 66		$2,089 66

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

BOSTON, December 31, 1878.

Massachusetts Horticultural Society,

To the Proprietors of the Cemetery of Mount Auburn, *Dr.*

For one-fourth part of the following expenditures for grading lands during 1878:

Stone Farm.		
137¼ days, men,	$240 19	
63¾ " man and horse,	191 25	
		$431 44
Vernonin Path.		
8¼ days, men,	14 44	
10½ " man and horse,	31 50	
		45 94
Fountain Avenue.		
409¾ days, men,	717 06	
148½ " man and horse,	445 50	
		1,162 56
		$1,639 94
One-fourth part,		$409 98

Mount Auburn, Dec. 31, 1878. J. W. Lovering, *Supt.*

I certify the foregoing to be a true copy of accounts of improvements for the year 1878, rendered by the Superintendent.

H. B. Mackintosh, *Treasurer.*

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1879.

President.

WILLIAM GRAY, Jr., of Boston.

Vice-Presidents.

CHARLES O. WHITMORE, of Boston.
H. WELD FULLER, of Boston.
CHARLES H. B. BRECK, of Brighton.
JOHN C. HOVEY, of Cambridge.

Treasurer.

EDWIN W. BUSWELL, of Boston.

Secretary.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees:

Executive.

The President, WILLIAM GRAY, Jr., Chairman.
The Ex-Presidents, MARSHALL P. WILDER, CHARLES M. HOVEY, JAMES F. C. HYDE, WILLIAM C. STRONG, FRANCIS PARKMAN; Chairman of Finance Committee, C. O. WHITMORE; FEARING BURR, A. T. PERKINS, HERVEY DAVIS, F. L. AMES.

* Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Finance.

CHARLES O. WHITMORE, Chairman.
H. HOLLIS HUNNEWELL, BENJAMIN P. CHENEY.

Publication and Discussion.

WILLIAM C. STRONG, Chairman.
A. B. MUZZEY, E. LEWIS STURTEVANT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, Chairman.
CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS.
C. M. ATKINSON, P. BROWN HOVEY, AND THE CHAIRMAN OF THE FINANCE COMMITTEE.

Library.

WILLIAM E. ENDICOTT, Chairman.
HENRY P. WALCOTT, FRANCIS H. APPLETON,
J. D. W. FRENCH, ROBERT MANNING.
THE PROFESSOR OF BOTANY AND HORTICULTURAL PHYSIOLOGY.
THE PROFESSOR OF ENTOMOLOGY.

Gardens.

JOSEPH H. WOODFORD, Chairman.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES.
GEORGE S. HARWOOD, HENRY ROSS, JOHN G. BARKER.

Fruit.

JOHN B. MOORE, Chairman.

P. BROWN HOVEY,	BENJAMIN G. SMITH,	J. W. MANNING,
E. W. WOOD,	CHARLES F. CURTIS,	O. B. HADWEN.

Plants and Flowers.

WILLIAM H. SPOONER, Chairman.

E. H. HITCHINGS,	JAMES COMLEY,	GEORGE CRAFT,
PATRICK NORTON,	F. L. HARRIS,	JAMES NUGENT.

Vegetables.

CHARLES N. BRACKETT, Chairman.

JOSIAH CROSBY,	JOHN FILLEBROWN,	SAMUEL HARTWELL,
WALTER RUSSELL,	GEORGE W. PIERCE,	CHARLES E. GRANT.

Committee of Arrangements.

CHARLES H. B. BRECK, Chairman.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND GARDENS.

GEORGE W. PIERCE,	JOHN C. HOVEY,	M. H. MERRIAM,
GEORGE HILL,	C. M. ATKINSON,	E. W. WOOD,
HERVEY DAVIS,	EDWIN A. HALL.	

HONORARY MEMBERS.

A * denotes the member deceased.

*Benjamin Abbott, LL. D., Exeter, N. H.
*John Abbott, Brunswick, Me.
*Hon. John Quincy Adams, LL. D., late President of the United States.
*Prof. Louis Agassiz, Cambridge.
*William T. Aiton, late Curator of the Royal Gardens, Kew.
Thomas Allen, Ex-President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.
*Hon. Samuel Appleton, Boston.
*Hon. James Arnold, New Bedford.
*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.
*Hon. Philip P. Barbour, Virginia.
*Robert Barclay, Bury Hill, Dorking, Surrey, England.
*James Beekman, New York.
*L'Abbé Berlèse, Paris.
*Nicholas Biddle, Philadelphia.
*Dr. Jacob Bigelow, Boston.
*Mrs. Bigelow, Medford.
*Le Chevalier Soulange Bodin, late Secrétaire-Général de la Société d'Horticulture de Paris.
Hon. George S. Boutwell, Groton.
*Josiah Bradlee, Boston.
*Hon. George N. Briggs, Pittsfield.
*Hon. James Buchanan, late President of the United States.
*Jesse Buel, late President of the Albany Horticultural Society.
*Hon. Edmund Burke, late Commissioner of Patents, Washington, D. C.
*Augustin Pyramus de Candolle, Geneva.
Hon. Horace Capron, Ex-U. S. Commissioner of Agriculture, Washington, D. C.
*Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.
*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Kentucky.
H. W. S. Cleveland, Chicago, Ill.
*Admiral Sir Isaac Coffin, Bart., England.
*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Roswell L. Colt, Paterson, N. J.
Caleb Cope, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.

*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. H. A. S. Dearborn, Roxbury.
*James Dickson, late Vice-President of the London Horticultural Society.
*Mrs. Dorothy Dix, Boston.
*Capt. Jesse D. Elliot, U. S. Navy.
*Hon. Stephen Elliot, LL. D., Charleston, S. C.
*Allyn Charles Evanson, St. John, N. B., late Secretary of the King's County Agricultural Society.
*Hon. Edward Everett, LL. D., Boston.
*Hon. Horace Everett, Vermont.
*F. Falderman, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Garden, St. Petersburg.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society.
*Joseph Gales, Jr., late Vice-President of the Horticultural Society, Washington, D. C.
*George Gibbs, New York.
*Stephen Girard, Philadelphia.
*Hon. Robert H. Goldsborough, Talbot County, Maryland.
*Ephraim Goodale, South Orrington, Maine.
*Mrs. Rebecca Gore, Waltham.
*Hon. John Greig, late President of the Domestic Horticultural Society, Canandaigua, N. Y.
*Mrs. Mary Griffith, Charlies Hope, N. J.
*Gen. William Henry Harrison, late President of the United States.
*S. P. Hildreth, M. D., Marietta, O.
*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.
*Louis Hunt, Huntsburg, O.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Gen. Andrew Jackson, late President of the United States.
*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, LL. D., East Rockport, O.
*Thomas Andrew Knight, late President of the London Horticultural Society.
*Gen. La Fayette, La Grange, France.
Le Comte de Lasteyrie, Vice-President of the Horticultural Society of Paris.
A. H. Latour, M. P., 1396 St. Catherine Street, Montreal, Canada.
*Baron Justus Liebig, Giessen, Germany.

*Prof. John Lindley, late Secretary of the London Horticultural Society.
Franklin Litchfield, U. S. Consul at Puerto Cabello.
*Joshua Longstreth, Philadelphia.
*Nicholas Longworth, Cincinnati.
*Jacob Lorillard, late President of the New York Horticultural Society.
*John C. Loudon, London.
John A. Lowell, Boston.
*Baron H. Carol Von Ludwig, Cape Town, Cape of Good Hope.
*Hon. Theodore Lyman, Brookline.
Col. Theodore Lyman, Brookline.
*Hon. James Madison, late President of the United States.
*Mrs. Charlotte Marryatt, Wimbledon, near London.
Joseph Maxwell, Rio Janeiro.
D. Smith McCauley, U. S. Consul-General, Tripoli.
*Hon. Isaac McKim, late President of the Horticultural Society of Maryland.
Rev. James H. Means, Dorchester, Mass.
*James Mease, M. D., Philadelphia.
*Lewis John Mentens, Brussels.
*Hon Charles F. Mercer, Virginia.
*François André Michaux, Paris.
Donald G. Mitchell, New Haven, Ct.
*Samuel L. Mitchill, LL. D., New York.
*Hon. James Monroe, late President of the United States.
*A. N. Morin, Montreal, Canada.
*Théodore Mosselmann, Antwerp, Belgium.
*Alfred Munson, M. D., late President of the New Haven Horticultural Society.
Baron Ottenfels, Austrian Minister to the Ottoman Porte.
John Palmer, Calcutta.
*Hon. Joel Parker, LL. D., Cambridge.
Samuel B. Parsons, Flushing, N. Y.
*Hon. Thomas H. Perkins, Brookline.
*A. Poiteau, late Professor in the Institut Horticole de Fromont.
*Hon. James K. Polk, late President of the United States.
*John Hare Powel, Powelton, Pa.
*Henry Pratt, Philadelphia.
*William Prince, Flushing, N. Y.
*Rev. George Putnam, D. D., Roxbury.
*Joel Rathbone, late President of the Albany and Rensselaer Horticultural Society, Albany.
*Archibald John, Earl of Roseberry, late President of the Caledonian Horticultural Society.
*Joseph Sabine, late Secretary of the London Horticultural Society.
*Don Ramon de la Sagra, Cuba.
Henry Winthrop Sargent, Fishkill, N. Y.
*Sir Walter Scott.
*William Shaw, New York.

*John Shepherd, late Curator of the Botanic Garden, Liverpool.
*John S. Skinner, Baltimore.
George W. Smith, Boston.
*Stephen H. Smith, late President of the Rhode Island Horticultural Society.
*Judge E. B. Strong, Rochester.
*Hon. Charles Sumner, Boston.
*Gen. Zachary Taylor, late President of the United States.
*Hon. John Taliaferro, Virginia.
*Gen. James Tallmadge, late President of the American Institute, New York.
*James Thacher, M. D., Plymouth.
John J. Thomas, Union Springs, N. Y.
*James W. Thompson, M. D., Wilmington, Del.
*Grant Thorburn, New York.
*M. Du Petit Thouars, Paris, late President of the Institut Horticole de Fromont.
*Le Vicomte Hericart de Thury, late President of the Horticultural Society of Paris.
*Mons. Tougard, late President of the Horticultural Society of Rouen, France.
*Gen. Nathan Towson, late President of the Horticultural Society, Washington, D. C.
*Col. W. Towson, late President of the Agricultural Society, Washington, D. C.
*Hon. John Tyler, late President of the United States.
*Rev. Joseph Tyso, Wallingford, England.
*Hon. Martin Van Buren, late President of the United States.
*Federal Vanderburg, M. D., New York.
*Jean Baptiste Van Mons, M. D., Brussels.
*Gen. Stephen Van Rensselaer, Albany, N. Y.
Joseph R. Van Zandt, Albany, N. Y.
*Benjamin Vaughan, Hallowell, Me.
*Petty Vaughan, London.
*Rev. N. Villeneuve, Montreal.
*Pierre Phillippe André Vilmorin, Paris.
*James Wadsworth, Geneseo, N. Y.
*Nathaniel Wallich, M. D., late Curator of the Botanic Garden, Calcutta.
*Malthus A. Ward, late Professor in Franklin College, Athens, Ga.
*Hon. Daniel Webster, Marshfield.
*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
Hon. Robert C. Winthrop, Boston.
*Frederick Wolcott, Litchfield, Conn.
*Lawrence Young, late President of the Kentucky Horticultural Society Louisville.
*Ashton Yates, Liverpool.

CORRESPONDING MEMBERS.

A * denotes the members deceased.

*John Adlum, Georgetown, D. C.
*Mons. Alfroy, Lieusaint, France.
A. B. Allen, Tom's River, N. J.
James T. Allan, Ex-President of the Nebraska State Horticultural Society, Omaha, Neb.
Rev. Thomas D. Anderson, New York.
*Thomas Appleton, late U. S. Consul, Leghorn.
Don Francisco Aguilar, Maldonado, Banda Oriental del Uruguay.
*Thomas Aspinwall late U. S. Consul at London, Brookline.
P. M. Augur, State Pomologist, Middlefield, Conn.
*Isaac Cox Barnet, late U. S. Consul, Paris.
Patrick Barry, Chairman of the General Fruit Committee of the American Pomological Society, Rochester, N. Y.
*Augustine Baumann, Bolwiller, Alsace.
*Eugéne Achille Baumann, Bolwiller, Alsace.
*Joseph Bernard Baumann, Bolwiller, Alsace.
Napoleon Baumann, Bolwiller, Alsace.
D. W. Beadle, St. Catherine's, Canada West.
Prof. W. J. Beal, Lansing, Michigan.
*Noel J. Becar, Brooklyn, N. Y.
*Edward Beck, Worton College, Isleworth, near London.
Rev. Henry Ward Beecher, Peekskill, N. Y.
Louis Édouard Berckmans, Rome, Ga.
Prosper J. Berckmans, Augusta, Ga.
*Alexandre Bivort, late Secrétaire Général de la Société Van Mons, Fleurus, Belgique.
*Mons. Tripet Le Blanc, Paris.
*Charles D. Bragdon, Pulaski, Oswego Co., N. Y.
*William D. Brincklé, M. D., Philadelphia.
*John W. Brown, Fort Gaines, Ga.
Dr. Nehemiah Brush, East Florida.
Arthur Bryant, Sr., Ex-President of the Illinois State Horticultural Society, Princeton., Ill.
Robert Buist, Philadelphia.
*E. W. Bull, Hartford, Conn.
Rev. Robert Burnet, President of the Ontario Fruit Growers' Association, Hamilton, Canada West.
Alexander Burton, Cadiz.

Isidor Bush, Bushberg, Jefferson Co., Mo.
William Bull, Chelsea, England.
George W. Campbell, Delaware, Ohio.
*Francis G. Carnes, New York.
*Robert Carr, Philadelphia.
*James Colvill, Chelsea, England.
*Rev. Henry Colman, Boston.
Benjamin E. Cotting, M. D. Boston.
*S. L. Dana, M. D., Lowell.
J. Decaisne, Professeur de Culture au Muséum d' Histoire Naturelle, Jardin des Plantes, Paris.
*James Deering, Portland, Me.
*H. F. Dickehut.
*Sir C. Wentworth Dilke, Bart., London.
*Hon. Allen W. Dodge, Hamilton, Mass.
Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.
Charles Downing, Newburg, N. Y.
Parker Earle, Cobden, Ill.
*F. R. Elliott, late Secretary of the American Pomological Society, Cleveland, Ohio.
*Hon. Henry L. Ellsworth, late Commissioner of Patents, Washington, D. C.
George Ellwanger, Rochester, N. Y.
George B. Emerson, LL. D., Winthrop.
*Ebenezer Emmons, M. D., Williamstown.
*A. H. Ernst, Cincinnati.
*Nathaniel Fellows, Cuba.
*Henry J. Finn, Newport, R. I.
*W. C. Flagg, late Secretary of the American Pomological Society, Moro, Ill.
*Michael Floy, late Vice-President of the New York Horticultural Society, New York City.
*John Fox, Washington, D. C.
*Hon. Russell Freeman, Sandwich.
Andrew S. Fuller, Ridgewood, N. J.
Henry Weld Fuller, Roxbury.
R. W. Furnas, President of the Nebraska State Horticultural Society, Brownville, Neb.
*Augustus Gande, late President of the Horticultural Society, Department of Sarthe, France.
*Robert H. Gardiner, Gardiner, Me.
*Benjamin Gardner, late U. S. Consul at Palermo.
*Capt. James P. Gerry, U. S. Navy.
*Abraham P. Gibson, late U. S. Consul at St. Petersburg.
*R. Glendenning, Chiswick, near London.
Prof. George L. Goodale, Cambridge.
Prof. Asa Gray, Cambridge.
O. B. Hadwen, Ex-President of the Worcester County Horticultural Society, Worcester.

*Charles Henry Hall, New York.
*Abraham Halsey, New York.
Dr. Charles C. Hamilton, President of the Fruit Growers' Association and International Show Society of Nova Scotia, Cornwallis.
*Rev. Thaddeus Mason Harris, D. D., Dorchester.
*Thaddeus William Harris, M. D., Cambridge.
*John Hay, late Architect of the Caledonian Horticultural Society.
*Bernard Henry, Philadelphia.
Shirley Hibberd, Editor of the Gardener's Magazine, London.
*J. J. Hitchcock, Baltimore.
Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.
*Thomas Hogg, New York.
Thomas Hogg, New York.
J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.
Rev. S. Reynolds Hole, Caunton Manor, Newark, Nottinghamshire, England.
Fisher Holmes, Sheffield, England.
Sir Joseph Hooker, K. C. S. I., Director of the Royal Botanic Garden, Kew, England.
Josiah Hoopes, West Chester, Pa.
Prof. E. N Horsford, Cambridge.
*Sanford Howard, Chicago, Ill.
Dr. William M. Howsley, President of the Kansas State Horticultural Society, Leavenworth.
*Isaac Hunter, Baltimore.
*Isaac Hurd, Cincinnati, Ohio.
George Husmann, Sedalia, Pettis County, Mo.
Thomas P. James, Cambridge.
Edward Jarvis, M. D., Dorchester.
William J. Johnson, M. D., Fort Gaines, Ga.
Samuel Kneeland, M. D., Boston.
*Mons. Laffay, St. Cloud, near Paris, France.
David Landreth, Ex-Corresponding Secretary of the Pennsylvania Horticultural Society, Bristol, Pa.
C. C. Langdon, Mobile, Alabama.
*Dr. William LeBaron, late State Entomologist, Geneva, Ill.
G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.
*E. S. H. Leonard, M. D., Providence.
*André Leroy, Author of the Dictionnaire de Pomologie, Angers, France.
J. Linden, Ghent, Belgium.
Hon. George Lunt, Boston.
*F. W. Macondray, San Francisco, Cal.
*James J. Mapes, LL. D., Newark, N. J.
*A. Mas, late President of the Horticultural Society, Bourg-en-Bresse, France.
Dr. Maxwell T. Masters, Editor of the Gardener's Chronicle, London.

*James Maury, late U. S. Consul, Liverpool.
T. C. Maxwell, Geneva, N. Y.
*James McNab, late Curator of the Botanic Garden, Edinburgh, Scotland.
Thomas Meehan, Editor of the Gardener's Monthly, Germantown, Pa.
*Allen Melville, New York.
John Miller, M. D., Secretary of the Horticultural and Agricultural Society of Jamaica.
*Stephen Mills, Flushing, N. Y.
*Charles M'Intosh, Dalkeith Palace, near Edinburgh.
J. E. Mitchell, Philadelphia.
*William S. M'Lean, New York.
Guiseppe Monarchini, M. D., Canea, Isle of Candia.
Édouard Morren, Editor of the Belgique Horticole, Liége, Belgium.
*Horatio Newhall, M. D., Galena, Ill.
*David W. Offley, U. S. Agent, Smyrna.
James Ombrosi, U. S. Consul, Florence.
*John J. Palmer, New York.
*Victor Paquet, Paris.
*John W. Parker, late U. S. Consul, Amsterdam.
*Andrew Parmentier, Brooklyn, N. Y.
William Paul, Waltham Cross, London, N.
*Sir Joseph Paxton, M. P., Chatsworth, England.
*John L. Payson, late U. S. Consul, Messina.
*Com. M. C. Perry, U. S. Navy.
*David Porter, late U. S. Chargé d' Affaires at the Ottoman Porte.
*Alfred S. Prince, Flushing, N. Y.
*William R. Prince, Flushing, N. Y.
P. T. Quinn, Newark, N. J.
Rev. Rushton Radclyffe, London, England.
*William Foster Redding. Baltimore, Md.
D. Redmond, Ocean Springs, Miss.
M. D. Reynolds, Schenectady, N. Y.
*John H. Richards, M. D., Illinois.
Charles V. Riley, Entomologist, Washington, D. C.
*Mons. J. Rinz, Jr., Frankfort-on-the-Main.
*Thomas Rivers, Sawbridgeworth, Herts, England.
William Robinson, Editor of The Garden, London.
*Dr. J. Smyth Rogers, New York.
*Capt. William S. Rogers, U. S. Navy.
Bernard Rosier, M. D., Athens, Greece.
*Thomas Rotch, Philadelphia.
*George R. Russell, Roxbury.
John B. Russell, Newmarket, N. J.
*Rev. John Lewis Russell, Salem.
William Saunders, Department of Agriculture, Washington, D. C.
*William Shaler, late U. S. Consul-General, Havana, Cuba.
*Caleb R. Smith, Burlington, N. J.

*Daniel D. Smith, Burlington, N. J.
*Gideon B. Smith, late Editor of the American Farmer, Baltimore.
John Jay Smith, Germantown, Pa.
*Horatio Sprague, late U. S. Consul, Gibraltar.
Robert W. Starr, Port William, Nova Scotia.
Dr. John Stayman, Leavenworth, Kansas.
*Thomas H. Stevens, U. S. Navy, Middletown, Conn.
William F. Strangeway, British Secretary of Legation at Naples.
Dr. J. Strentzel, Martinez, Cal.
*James P. Sturgis, Canton.
William Summer, Pomaria, S. C.
Francis Summerest.
*Prof. Tenore, late Director of the Botanic Garden at Naples.
*J. E. Teschemacher, Boston.
*Robert Thompson, London.
*George C. Thorburn, New York.
Prof. George Thurber, Editor of the American Agriculturist, New York.
John Tilson, Jr., Edwardsville, Illinois.
Cav. Doct. Vincent Tinio, Director of the Botanic Garden at Palermo.
*Luther Tucker, Editor of the Cultivator, Albany, N. Y.
Carey Tyso, Wallingford, England.
*Louis Van Houtte, Ghent, Belgium.
*Alexander Vattemare, Paris.
*Emilien de Wael, Antwerp, Belgium
John A. Warder, M. D., President of the Ohio State Horticultural Society, Cleves, O.
Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
*J. Ambrose Wight, Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Holloway, London, N.
Prof. John Wilson, Edinburgh University, Scotland.
*William Wilson, New York.
*Col. J. F. Wingate, Bath, Me.
*Joshua Wingate, Portland.
*Joseph Augustus Winthrop, Charleston, South Carolina.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

Adams, George E.,	Medford.
Albro, Charles,	Taunton.
Alger, R. F.,	Hinsdale.
Ames, F. L.,	Easton.
Ames, F. M.,	Canton.
Ames, George,	Boston.
Ames, P. A.	"
Amory, Charles,	"
Amory, Frederick,	Brookline.
Amory, James S.,	Boston.
Anderson, Alexander,	Hingham.
Andrews, Charles L.,	Swampscott.
Andrews, Frank W.,	Boston.
Andrews, W. T.,	"
Andros, Milton,	Brookline.
Appleton, Edward,	Reading.
Appleton, Francis H.,	Peabody.
Appleton, Wm. S.,	Boston.
Atkins, Elisha,	Belmont.
Avery, Edward,	Boston.
Ayer, Adams,	"
Ayling, Isaac,	"
Bacon, George,	Brookline.
Bailey, Edwin C.,	Concord, N. H.
Baker, Wm. E.	Boston.
Bancroft, J. C.,	Milton.
Banfield, F. L.,	Boston.
Barnard, Rev. C. F.,	"
Barnard, James M.,	"
Barnard, R. M.,	Everett.
Barnes, Walter S.,	Somerville.
Barnes, Wm. H.,	Boston.
Barney, Levi C.,	"
Barratt, James,	Cambridge.
Barrows, Thomas,	Dedham.
Bartlett, E.,	Newburyport.
Bates, Amos,	Hingham.
Bates, Caleb,	Kingston.
Bayley, John P.,	Boston.
Beal, Alexander,	Dorchester.
Beckford, D. R., Jr.,	Dedham.
Bell, Joseph H.,	Quincy.
Bemis, Emery,	Grantville.
Berry, James,	Boston.
Bickford, Weare D.,	Allston.
Birchard, Charles,	Arlington.
Black, J. W.,	Boston.
Blagg, Samuel	Newbern, N. C.
Blanchard, J. W.,	Boston.
Blaney, Henry,	Brookline.
Blinn, R. D.,	Lexington.
Bocher, F.,	Boston.
Bockus, C. E.,	Dorchester.
Bond, George W.,	Boston.
Borland, J. N.,	"
Botume, John,	Stoneham.
Bowker, Wm. H.,	Boston.
Bouvé, Thomas T.,	"
Bowditch, A. C.,	Somerville.
Bowditch, J. Ingersoll,	Boston.
Bowditch, Wm. E.,	"
Brackett, C. H.,	Brighton.
Brackett, C. N.,	Newton.
Bradish, L. J.	Boston.
Bragg, S. A. B.,	Mattapan.
Breed, Andrews,	Lancaster.
Breed, Henry A.,	Lynn.
Bresee, Albert,	Hortonville, Vt.
Brewer, John Reed,	Boston.
Brewer, Otis,	"
Brigham, W. T.,	"
Bright, Jona. B.,	Waltham.
Bright, William E.,	"

Brimmer, Martin,	Boston.	Clapp, J. H.,	Dorchester.
Brintnall, Benj.,	"	Clapp, Lemuel,	"
Brooks, Francis,	Medford.	Clapp, William C.,	"
Brooks, J. W.,	Milton.	Clark, Orus,	Boston.
Brooks, Peter C.,	Boston.	Clark, W. L.,	Neponset.
Brown, Charles E.,	Yarmouth, N.S.	Clark, William S.,	Amherst.
Brown, Edward J.,	Brookline.	Clarke, Miss Cora H.,	Jamaica Plain.
Brown, G. Barnard,	Boston.	Clay, Henry,	Dorchester.
Brown, George B.,	"	Cleary, Lawrence,	West Roxbury.
Brown, Jacob,	Woburn.	Clement, Asa,	Dracut.
Brownell, E. S.,	Essex Junc., Vt.	Cleveland, Ira,	Dedham.
Bruce, N. F.,	Stoneham.	Cobb, Albert A.,	Brookline.
Bullard, Wm. S.,	Boston.	Coburn, Isaac E.,	Everett.
Burnett, Joseph,	Southborough.	Codman, James M.,	Brookline.
Burnham, T. O. H. P.,	Boston.	Codman, Ogden,	Lincoln.
Burr, Fearing,	Hingham.	Coffin, G. Winthrop,	West Roxbury.
Burr, Matthew H.,	"	Coffin, William E.,	Boston.
Buswell, E. W.,	Boston.	Converse, E. S.,	Malden.
Buswell, Frank E.,	"	Coolidge, Joshua,	Watertown.
Butler, Aaron,	Wakefield.	Copeland, Franklin,	West Dedham.
Butterfield, Wm. P.,	Arlington.	Cox, George P.,	Malden.
		Coy, Samuel I.,	Boston.
Cadness, John,	Flushing, N. Y.	Craft, George,	Brookline.
Cains, William,	South Boston.	Crocker, Uriel,	Boston.
Calder, A. P.,	Boston.	Crosby, Josiah,	Arlington.
Capen, John,	"	Crowell, Philander,	Chelsea.
Carlton, Samuel A.,	Somerville.	Crowell, R. H.,	"
Carruth, Charles,	Boston.	Cruickshanks, James,	"
Carruth, Nathan,	Dorchester.	Cummings, John,	Woburn.
Carter, Miss Sabra,	Wilmington.	Curtis, Charles F.,	West Roxbury.
Chamberlain, C. W.,	Arlington.	Curtis, George S.,	Jamaica Plain.
Chandler, J. G.,	Lancaster.	Cushing, J. G.,	Boston.
Chapin, N. G.,	Brookline.	Cushing, R. M.,	"
Chapman, Edward,	Arlington.		
Chase, A. J.,	Lynn.	Daggett, H. C.,	Boston.
Chase, Daniel E.,	Somerville.	Damon, Samuel G.,	Arlington.
Chase, Hezekiah S.,	Boston.	Dana, Charles B.,	Brookline.
Chase, William M.,	Worcester.	Darling, Charles K.,	Boston.
Cheney, B. P.,	Boston.	Davenport, Edward,	Dorchester.
Child, F. J.,	Cambridge.	Davenport, Geo. E.,	Boston.
Child, William C.,	Medford.	Davenport, Henry,	"
Childs, Francis,	Charlestown.	Davis, Curtis,	Cambridge.
Childs, N. R.,	Dorchester.	Davis, Hervey,	Cambridgeport.
Claflin, Henry,	Brighton.	Dawson, Jackson,	West Roxbury.
Claflin, William,	Newton.	Deblois, S. G.,	Boston.
Clapp, Edward B.,	Dorchester.	Denny, C. H.,	"
Clapp, E. W.,	Walpole.	Denny, R. S.,	Dorchester.

Denton, Eben,	Braintree.
DeWolf, John L.,	Boston.
Dewson, F. A.,	"
Dexter, F. Gordon,	"
Dickerman, Geo. H.,	Somerville.
Dickinson, Alex.,	Cambridgeport.
Dike, Charles C.,	Stoneham.
Dix, Joseph,	Boston.
Dorr, George,	Dorchester.
Dove, George W.W.,	Andover.
Downer, Samuel,	Dorchester.
Durant, H. F.,	Boston,
Durant, William,	"
Durfee, Mrs. F. B.,	Fall River.
Durfee, George B.,	" "
Eaton, Horace,	Quincy.
Eldridge, E. H.,	Boston.
Ellicott, J. P.,	Jamaica Plain.
Endicott, Wm. E.,	Canton.
Everett, George,	Concord.
Everett, Otis,	Boston.
Everett, William,	"
Farlow, John S.,	Newton.
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Fay, Mrs. R. L.,	Chelsea.
Fenno, J. B.,	Boston.
Fewkes, Edwin,	Ipswich.
Fillebrown, John,	Arlington.
Fisher, James,	Boston.
Fisher, Warren,	"
Flagg, Augustus,	Boston,
Fleming, Edwin,	West Newton.
Fleming, William,	" "
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Flint, D. B.,	Watertown.
Flynt, William N.,	Monson.
Foster, John H.,	Boston.
Fowle, W. B.,	Auburndale.
Freeland, Chas. Wm.,	Boston.
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French, Jonathan,	Boston.
French, J. D. W.,	"
Fuller, Henry Weld,	"
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Gillard, William,	Boston.
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Glover, Albert,	Boston.
Glover, Joseph B.,	"
Goddard, A. Warren,	Brookline.
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Gould, Francis,	Arlington.
Gould, Samuel,	Boston.
Gray, James,	Wellesley.
Gregory, J. J. H.,	Marblehead.
Greig, George,	Newton.
Grinnell, Joseph,	New Bedford.
Groom, Thomas,	Dorchester.
Grundel, H.,	"
Guild, J. Anson,	Brookline.
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Hall, George A.,	Chelsea.
Hall, George R.,	Boston.
Hall, John R.,	"
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Hall, Stephen A.,	Revere.
Hall, William F.,	Brookline.
Halliday, W. H.,	Boston.
Hammond, Gard. G.,	"
Hammond, Samuel,	"
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Harding, G. W.,	Dorchester.
Harding, L. B.,	Boston.
Harding, W. C.,	"
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Hatch, Anthony,	Cliftondale.
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Hayes, Daniel F.,	Exeter, N. H.
Hayes, Francis B.,	Boston.
Hazeltine, H.,	"
Head, Charles D.,	Brookline.
Hilbourn, A. J.,	Chelsea.

Hill, George,	Arlington.	Keyes, E. W.	Denver, Col.
Hill, John,	Stoneham.	Keyes, George,	Concord.
Hitchings, E. H.,	Boston.	Kidder, H. P.,	Boston.
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Hooper, Thomas,	Bridgewater.	Kingman, C. D.,	Middleborough.
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Hovey, C. M.,	"		
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Hovey, P. B.,	"	Lancaster, C. B.,	Newton.
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Hubbard, G. G.,	Cambridge.	Lawrence, James,	Groton.
Hubbard, J. C.,	Boston.	Lawrence, John,	Boston.
Hubbard, W. J.,	"	Lawson, Peter,	Lowell.
Huckins, J. W.,	"	Leavens, S. Davis,	Boston.
Humphrey, F. J.,	Dorchester.	Lee, Henry,	"
Humphrey, G. W.,	Dedham.	Lemme, Frederick,	Natick.
Hunneman, Jos. H.,	Boston.	Leuchars, R. B.,	Boston.
Hunnewell, H. H.,	Wellesley.	Lewis, A. S.,	Framingham.
Hunt, Franklin,	Boston.	Lewis, William G.,	"
Hunt, Moses,	"	Lincoln, D. Waldo,	Worcester.
Hyde, J. F. C.,	Newton.	Lincoln, George,	Hingham.
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Inches, Henderson,	Boston.	Lodge, Giles H.,	Swampscott.
Inches, Herman B.,	"	Loftus, John P.,	Boston.
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Jackson, Abraham,	Boston.	Lord, George C.,	Newton.
Janvrin, W. S.,	Revere.	Loring, Alfred,	South Hingham.
Jeffries, John, Jr.,	Boston.	Loring, C. W.,	Boston.
Jenks, C. W.,	"	Lothrop, Eben W.,	Chelsea.
Johnson, Francis M.,	Newton Centre.	Lovett, G. L.,	Boston.
Joyce, Mrs. Samuel,	Medford.	Low, Ariel,	"
		Lowder, John,	Watertown.
Kakas, Edward,	Medford.	Lowell, Augustus,	Boston.
Kelley, E. G.,	Newburyport.	Luke, Elijah H.,	Cambridgeport.
Kendall, D. S.,	Woodstock, Ont.	Lumb, Wm.,	Boston.
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Kendall, J. R.,	Woburn.	Lyman, Theodore,	Brookline.
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Kennedy, G. G.,	Boston.		
Kenney, John M.,	Wareham.	Mahoney, John,	Boston.
Kent, John,	Charlestown.	Mann, James F.,	Cambridge.

Mann, Jonathan,	Cambridge.
Manning, J. W.,	Reading.
Manning, Mrs. L. B.,	"
Manning, Robert,	Salem.
Mansfield, H. S.,	Blackstone.
Marland, A.,	Andover.
Marsh, Francis,	Dedham.
Marshall, Frederick,	Everett.
Martin, D. A.,	Chelsea.
Martin, J. S.,	Boston.
Mason, R. M.,	"
Matthews, Nathan,	"
McCarthy, T.,	"
McClure, John,	Revere.
Merriam, M. H.,	Lexington
Merrifield, W. T.,	Worcester.
Miller, E. D.,	Dorchester.
Mills, Charles H.,	Boston.
Milmore, M ,	"
Milton, W. H.,	"
Minott, Charles,	Somerville.
Minton, James,	Dorchester.
Mixter, Charles,	Boston.
Moore, John B.,	Concord.
Morrill, Joseph, Jr.,	Boston.
Morse, S. B.,	"
Morse, Samuel F.,	"
Motley, Thomas,	West Roxbury.
Mudge, E. R.,	Swampscott.
Mudge, George A.,	Brookline.
Mudge, George W.,	Lynn.
Munroe, Otis,	Boston.
Needham, Daniel,	Groton.
Newhall, George,	Dorchester.
Newhall, Josiah,	Lynnfield.
Newman, J. R.,	Winchester.
Newton, W. W.,	Brookline.
Nichols, Mrs. F.,	Dorchester.
Nourse, Benjamin F.,	Cambridgeport.
Nourse, B. F.,	Boston.
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Otis, T. C.,	"
Oxnard, George D.,	"
Packer, C. H.,	Boston.
Page Thomas,	Milwaukee.
Paine, Robert T.,	Boston.
Palmer, J. P.,	"
Park, J. C.,	Somerville.
Parker, Augustus,	Boston.
Parker, William A.,	"
Parkman, Francis,	Jamaica Plain.
Partridge, Henry,	Dunkirk, N. Y.
Partridge, Horace,	Somerville.
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Peck, W. G ,	Arlington
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Perkins, Augustus T.,	Boston.
Perkins, Edward N.,	Brookline.
Perkins, William P.,	"
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Pierce, Henry L.,	Dorchester.
Pierce, S. B.,	"
Poole, Benjamin C.,	Chelsea.
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Pope, Alexander,	Dorchester.
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Prang, L.,	Boston.
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Pray, Mark W.,	Malden.
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Prescott, Eben C.,	Boston.
Prescott, W. G.	"
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Preston, John,	Dorchester.
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Rawson, W. W.,	Arlington.
Rayner, John J.,	Lexington.

Reed, George W.,	Boston.
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Richards, William B.,	"
Richardson, C. E.,	"
Richardson, Geo. C.,	Cambridge.
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Robinson, J. H.,	Dorchester.
Rogers, John H.,	Boston.
Ross, Henry,	Newton.
Ross, M. D.,	Boston.
Ross, Waldo O.,	"
Russell, George,	W. Somerville.
Russell, N. P.,	Boston.
Russell, Walter,	Arlington.
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Sandford, O. S.,	Cordaville.
Sargent, Charles S.,	Brookline.
Sargent, Ignatius,	"
Saville, R. L.,	"
Sawyer, E. H.,	Easthampton.
Sawyer, Timothy T.,	Charlestown.
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Shaw, C. C.,	Boston.
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Sheafe, Charles C.,	Boston.
Sheafe, William,	Brookline.
Sheldon, O. S.,	Milton.
Shimmin, Charles F.,	Boston.
Shorey, John L ,	Lynn.
Skinner, Francis,	Boston.
Slack, Chas. W.,	"
Slack, Lewis,	Brookline.
Smith, Benj. G.	Cambridge.
Smith, Charles A.,	Boston.
Smith, Charles H.,	Jamaica Plain.
Smith, Chauncy,	Cambridge.
Smith, E. N.,	Boston.
Smith, George O.,	"
Smith, James H.,	Needham.
Smith, Joshua B.,	Cambridgeport.
Smith, Peter,	Andover.
Smith, W. B.,	Boston.
Snow, Eben,	Cambridge.
Southmayd, John K.,	Boston.
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Sparhawk, Geo.,	Lexington.
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Spaulding, M. D.,	Boston.
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Springall, George,	Malden.
Springer, John,	Sterling.
Stetson, James A.,	Quincy.
Stetson, Nahum,	Bridgewater.
Stickney, Rufus B.,	Somerville.
Stimpson, George,	New York.
Stimpson, H. H.,	Cambridge.
Stone, Amos,	Everett.
Stone, G. F.,	Newton.
Stone, Phineas J.,	Charlestown.
Story, E. A.,	Brighton.
Strong, William C.,	"
Sturgis, John H.,	Boston.
Sturgis, Russell, Jr.,	"
Sturtevant, E. Lewis,	S. Framingham.
Sumner, Edward,	Dedham.
Surette, L. A.,	Concord.
Swain, Charles D.,	Roxbury.
Taft, John B.,	Boston.
Tappan, Charles,	"
Taylor, Horace B.,	"
Thacher, Alfred C.,	Dorchester.
Thayer, Henry,	N. Cambridge.
Thayer, Nathaniel,	Boston.
Thompson, S. Benton,	Lexington.
Thorndike, John H.,	Boston.
Thurlow, T. C.,	Newburyport.
Tilton, Stephen W.,	Boston.
Todd, John,	Hingham.
Tolman, Benj.,	Concord.
Tolman, Miss H. S.,	Boston.
Torrey, Everett,	Charlestown.
Turner, J. M.,	Dorchester.
Turner, R. W.,	Newton.
Turner, Royal W.,	Randolph.

Underwood, Guy C.,	Boston.
Upham, Henry,	Brookline.
Vass, W. J.,	Boston.
Vinton, A. H., D. D.,	"
Vose, B. C.,	Hyde Park.
Wainwright, Peter,	Boston.
Wainwright, Wm. L.,	Braintree.
Wakefield, E. H.,	Chelsea.
Walcott, Edward,	Pawtucket.
Walcott, Henry P.,	Cambridge.
Walker, Edw. C. R.,	Boston.
Walker, Samuel A.,	"
Walker, T. W.,	Waltham.
Walley, Mrs. W. P.,	Boston.
Ward, John,	Newton.
Wardwell, W. H.,	" Centre.
Ware, Benjamin P.,	Marblehead.
Warren, G. W.,	Boston.
Wason, E.,	Brookline.
Waters, Edwin F.,	Newton Centre.
Waters, George F.,	Newton.
Watts, Isaac,	Belmont.
Webber, A. D.,	Boston.
Weld, Aaron D.,	West Roxbury.
Weld, Dr. M. W.,	Boston.
Weld, Richard H.,	"
Weld, W. G.,	Brookline.
Weston, L. W.,	Lincoln.
Weston, Seth,	Revere.
Wetherell, Leander,	Boston.
Wheelwright, A. C.,	Boston.
Whipple, John A.,	"
Whitcomb, Wm. B.,	Medford.
White, B. C.,	Boston.
White, Edward A.,	"
White, Francis A.,	Brookline.
Whitely, Edward,	Cambridge.
Whiting, Nathaniel,	Brookline.
Whitmore, C. O.,	Boston.
Whittle, George W.,	Somerville.
Whytal, Thomas G.,	West Roxbury.
Wilbur, G. B.,	Watertown.
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Wilder, Marshall P.,	Dorchester.
Williams, Aaron D.,	Boston.
Williams, Benj. B.	"
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Willis, George W.,	Chelsea.
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Wilson, Henry W.,	South Boston.
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Winship, Herman,	"
Woerd, C. V.,	Waltham.
Woerd, C. V., Jr.,	"
Wood, L. H.,	Marlborough.
Wood, R. W.,	Jamaica Plain.
Wood, Wm. K.,	West Newton.
Woodward, Royal,	Brookline.
Wright, George C.,	West Acton.
Wrisley, Frank,	New York.

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Allen, W. H.,	Dedham.
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Atkinson, Chas. M.,	Brookline.
Atkinson, Edward,	"
Atkinson, John,	West Newton.
Atkinson, W. B.,	Newburyport.
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Bacon, Augustus,	Boston.
Bacon, William,	"
Bard, James,	Framingham.
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Breck, C. H. B.,	"
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Brown, Jona., Jr.,	Somerville.
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Clark, Joseph,	Canton.
Clark, Joseph W.,	Dedham.
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Colby, E. P.,	Wakefield.
Cole, H. Hammond,	Chelsea.
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Dupee, James A.,	"	Grew, Henry,	"
Dyer, Mrs. E. D.,	Eyota, Minn.	Guerineau, Louis,	Malden.
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Edgar, William,	Newtonville.	Haley, Jesse,	Cambridgeport.
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Falconer, John,	Rochester.	Harris, F. L.,	South Natick.
Falconer, William,	Cambridge.	Hartwell, Samuel,	Lincoln.
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Foster, Nath'l, Jr.,	Belmont.	Hersey, Alfred H.,	Hingham.
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French, Henry F.,	Concord.	Hews, Albert H.,	No. Cambridge.
French, W. E.,	Boston.	Higbee, C. H.,	Salem.
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Frost, Stiles,	" "	Hill, Henry Y.,	Belmont.
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		Hinckley, Mrs. D. F.,	Chelsea.
Gane, Henry A.,	West Newton.	Hittinger, Miss M. E.,	Belmont.
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Gaut, S. N.,	Somerville.		
Gay, Timothy,	Chelsea.	Ireland, George W.,	Somerville.
Gilbert, John,	Boston.		
Gilbert, Samuel,	"	Jameson, G. W.,	East Lexington.
Gilbert, W. A.,	Neponset.	Jones, Moses,	Brookline.
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Gleason, C. W.,	Boston.		
Gleason, Herbert,	Malden.	Kelsey, Fred W.,	Waverly, N. Y.
Godbold, G. A.,	Chelsea.	Kendall, Jonas,	Framingham.
Goddard, Thomas,	Boston.	Kennard, M. P.,	Brookline.
Goodwin, Lester,	Brighton.	Kenrick, Miss A. C.,	Newton.

Lamprell, Simon,	Marblehead.	Olney, Richard,	West Roxbury,
Lang, John H. B.,	Dorchester.	Owen, John,	Cambridge.
Langmaid, S. P.,	Somerville.		
Langworthy, I. P.,	Chelsea.	Paine, Benjamin F.,	Boston.
Leavens, E. W.,	Malden.	Park, W. D.,	"
Lee, Francis H.,	Salem.	Parker, Harvey D.,	"
Lincoln, F. W., Jr.,	Boston.	Parker, John,	"
Livermore, Isaac,	Cambridgeport.	Parsons, William,	"
Livermore, Miss M.,	Mt. Auburn.	Parsons, William B.,	Rockport.
Loring, Charles G.,	Boston.	Patterson, James,	Cambridge.
Loring, John A.,	"	Payson, Samuel R.,	Boston.
Lothrop, D. W.,	West Medford.	Pettingill, Thos. S.,	Brookline.
Lothrop, H. A.,	Sharon.	Phillips, Nathaniel,	Dorchester.
Lothrop, Thornton K.,	Boston.	Plimpton, W. P.,	West Newton.
Lowell, John,	Newton.	Power, Charles J.,	S. Framingham.
		Pratt, L. G.,	West Newton.
Markoe, G. F. H.,	Boston.	Pratt, Samuel,	Chelsea.
May, F. W. G.,	"	Putnam, C. A.,	Salem.
McDermott, Andrew,	"	Putnam, H. W.,	"
McIntosh, A. S.,	"		
McLaren, Anthony,	Forest Hills.	Randall, Macey,	Sharon.
Mellen, George M.,	Brookline.	Ranlett, S. A.,	Melrose.
Merrick, John M.,	Walpole.	Richards, John S.,	Brookline.
Merrill, J. Warren,	Cambridgeport.	Richardson, E. P.,	Lawrence.
Merrill, S. A.,	Danvers.	Richardson, Horace,	Framingham.
Millar, John L.,	Boston.	Ridler, Charles E.,	Kingston.
Miller, David,	"	Roberts, Edward,	Hyde Park.
Minton, P. J.,	Forest Hills.	Rogers, John F.,	Cambridge.
Morandi, Francis,	Malden.	Russell, George,	Boston.
Morris, Thomas D.,	Boston.		
Morrison, Hugh,	Gloucester.	Saunders, Miss M.T.,	Salem.
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Morton, J. H.,	"	Sawtell, J. M.,	Fitchburg.
Murray, Daniel C.,	Brookline.	Schlegel, Adam,	Boston.
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		Scott, George H.,	Allston.
Nichols, J. R.,	Haverhill.	Scudder, Samuel H.,	Cambridge.
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Norton, M. H.,	Boston.	Shedd, Arthur B.,	"
Norton, P.,	"	Shepherd, C. W.,	West Newton.
Noyes, George N.,	Auburndale.	Shepherd, Edwin,	Lowell.
Nugent, James,	Boston.	Sherman, Japhet,	Medford.
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Oldreive, Richard,	Newton.	Southworth, Edward,	Quincy.

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Sprague, Charles J.,	Boston.	Walker, Wm. P.,	Somerville.
Squire, J. P.,	Arlington.	Wallis, William,	Boston.
Starbird, Louis D.,	Malden.	Walsh, M. H.,	Brighton.
Stearns, Charles,	Brookline.	Washburn, E. F.,	Neponset.
Stone, Eliphalet,	Dedham.	Watson, David,	Malden.
Stevenson, Hamilton,	Woburn.	Webster, John,	Salem.
Stone, Samuel G.,	Charlestown.	Wellington, Chas. A.,	E. Lexington.
Story, Miss Sarah W.,	Brighton.	Wellington, Jos. V.,	Cambridge.
Sullivan, J. L. D.,	Somerville.	Wells, Benjamin T.,	Boston.
Swan, C. W.,	Boston.	Weston, Mrs. L. P.,	Danvers.
		Wheatland, Henry,	Salem.
Tailby, Joseph,	Wellesley.	Wheeler, Miss Ann C.	Cambridgeport.
Tainter, A. E.,	Medford.	Wheildon, Wm. W.,	Concord.
Talbot, Josiah W.,	Norwood.	White, N. B.,	Norwood.
Tapper, Thomas,	Canton.	White, T. C.,	Charlestown.
Taylor, Moses,	Acton.	Whitney, Joel,	Winchester.
Tobey, Miss M. B.,	Brookline.	Wilde, Hiram,	Randolph.
Todd, Jacob,	Boston.	Williams, Dudley,	Jamaica Plain.
Torrey, Augustus.	Beverly.	Wilmarth, H. D.,	" "
Tower, Elisha,	Lexington.	Wilson, B. O.,	Watertown.
Trautman, Martin,	Boston.	Wilson, George W.,	Malden.
Tucker, E. G.,	"	Wiswall, Henry M.,	Watertown.
Turner, N. W.,	Everett.	Wolcott, Mrs. J. W.,	Boston.
		Wood, Mrs. Anna D.,	West Newton.
Underwood, Wm. J.,	Belmont.	Wood, Miss C. S.,	" "
		Wood, E. W.,	" "
Vandine, Henry,	Cambridgeport.	Woodford, Jos. H.,	Newton.
Vinton, Mrs. C. A.,	Boston.		
		Zirngiebel, D.,	Needham.
Walker, Charles H.,	Chelsea.		

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises

the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society: and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

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